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HEALTH AND NUTRITION OF WARBURTON RANGE NATIVES OF CENTRAL AUSTRALIA.

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Western Australia.

To obtain information about the incidence of disease and to ascertain the state of nutrition in Central Australian aborigines, a medical survey was carried out in the Warburton Range area of Western Australia.

Natives were examined in six different localities, which can be grouped in pairs as follows: (i) Laverton township and Weld pastoral station. The natives here obtain casual employment, and sustain themselves largely by this means rather than by hunting and foraging. (ii) Cosmo Newbery and Warburton Missions. Here the natives obtain a varying amount of food from the mission, depending on whether they are inhabitants of the mission or merely camped in the vicinity. (iii) Blackstone and Rawlinson Ranges. In these two situations the natives are entirely dependent on their hunting and foraging.

A great deal of movement takes place, however, between the Ranges and the missions, particularly Warburton Mission and missions beyond the State border, so that all natives seen can be considered to have had some contact

with missions. The survey did not include natives to the north of Warburton in and around the Gibson desert, and the findings in this report may not apply to whatever natives there are in that area.

METHOD.

The field work consisted of a clinical and ophthalmological examination and the taking of blood samples. The laboratory work, done in Perth laboratories, included hematological, biochemical and serological investigations. Separate papers have been prepared on the ophthalmological findings (Mann, 1957), the hematology (Davis and Pitney, 1957), and the serum proteins (Curnow, 1957).

The clinical examination was carried out on 300 natives distributed throughout the area, and was chiefly directed towards the following points: the gait; evidence of neural lesion, particularly ulnar, and ulnar nerve thickening; skin disease; condition of lips, gums, tongue and teeth; aural discharge; oedema; ascites; enlargement of liver and spleen; evidence of jaundice, yaws, and secondary and tertiary syphilis.

An index of nutritional state according to clinical appearance was recorded for each native, but was based on no measurable data.

The heights and weights of a number of children were recorded, but it was impossible to correlate these with ages, as ages could not be ascertained with sufficient accuracy.

RESULTS.

Nutrition.

Of the 290 natives of all ages for whom an index of nutritional state was recorded, 90 are classified as "good" or "above normal", 143 as "average" or "satisfactory", 51 as "fair" or "a little below average", and six as "poor".

The heights and weights of 21 boys and 20 girls are given in Table I. In Figure 1 the heights and weights are shown as points scattered around a graph of figures given by Davidson for heights and weights of Western Australian school-children, aged 5 to 14 years, for 1955. As ages could not be ascertained, the graph merely displays height-weight relationship.

TABLE I.
Heights and Weights of 21 Boys and 20 Girls.

Boys.		Girls.	
Height in Inches.	Weight in Pounds.	Height in Inches.	Weight in Pounds.
36	29	35	28, 25
37	30	36.5	28
40.5	34, 32	37	27
41	41	39.5	31
42	40, 36	40.25	34
42.5	40	41	35
45	40	42	35
45.5	46	44.5	42, 36
46.5	44, 42	46	40
47	48	46.5	42
48	55	50	52
51	54	54	54
52	58	56.5	70
53	68	58.5	88
56.5	62	59.5	90
58	88	60	75
60	95	61.5	9
60.5	94	62	119

Little definite information can be drawn from such small samples. Native girls appear to be thinner than Western Australian children, particularly around the nine to ten years age group, whereas native boys maintain a height-weight relationship similar to that of Western Australian schoolboys.

A few natives with very mild glossitis, which may have indicated a vitamin deficiency, were seen at Laverton and around the missions. Two natives with spongy gums which bled on being touched were seen at Laverton, and five at Warburton Mission. No other evidence of scurvy was obtained from these subjects.

Five cases of slight oedema in infants about the weaning age were seen in Laverton and Weld Station, two at Warburton Mission among 14 infants examined in the Laverton area, and 17 at Warburton. The oedema was confined to the feet and ankles, but two infants had a more generalized oedema of the "sugar baby" type of early kwashiorkor.

No glossitis or scurvy was noted among the natives at Blackstone or Giles.

There was no oedema among six infants examined at Blackstone, or in the 12 examined at Giles in the Rawlinsons.

No oedema was seen in older children or in adults.

Although the colour of the hair was recorded in the examination, it was useless as an indication of dietary deficiency, because the majority of the natives were naturally fair-haired to some extent or other.

Disease.

No case of leprosy was seen.

Primary syphilis was not looked for, but there was no evidence of secondary, tertiary or congenital syphilis.

Three cases of interstitial keratitis were seen in young people, two of them being siblings. The Wassermann test produced negative results in these cases; but in one of the siblings who had an old yaws scar, the Venereal Diseases Research Laboratory (V.D.R.L.) slide test produced a

positive result. There was no other stigma of congenital syphilis about these three, and the reason for the interstitial keratitis remains obscure, although yaws must be considered.

Several cases of an infected skin disease of a mild nature resembling secondary yaws were seen. Out of the 300 subjects examined there were six with sabre tibia, very slight in four of them. There was no flamboyant case of yaws or any lesion from that disease causing trouble in the natives seen. Many of them had previously had penicillin treatment from the missions or hospitals.

Of 66 V.D.R.L. cardiolipin flocculation slide tests, 21 produced positive results; this suggests a yaws infection rate in the vicinity of 30%. It is possible, however, that a number of positive results are due to non-specific infections. The picture of yaws in Central Australia is, therefore, similar to that along the coast. It is a disease highly infectious in its spread, but very mild in its manifestations. The vast majority of cases seem to cure themselves spontaneously and only very rarely are destructive ulcerations or tertiary bone lesions seen. Of the 21 positive responses to V.D.R.L. tests, only one was from a child, two subjects had sabre tibiae, two were recorded as having old yaws scars, one had depigmented patches, and one, already mentioned, had interstitial keratitis.

Head lice were seen on several natives, but less frequently than is the usual experience in examining half-caste natives in and around the city and country towns.

The condition of the teeth was remarkably good, dental caries not being at all apparent in the brief examination that the teeth received in this survey. Elderly people invariably retained a full, or almost full, set of teeth, worn down to the gums in many cases.

Several children had chronic suppurative otitis media, for which they were receiving treatment at mission hospitals.

The liver of one child was palpated at one finger's breadth below the costal margin. There was no case of ascites demonstrable by percussion. Jaundice was detected in one specimen of serum, but not clinically.

DISCUSSION.

The discussion must include some reference to the features described in the other papers dealing with the eye conditions, the hematology and the serum proteins.

Nutrition.

It is extremely difficult to estimate the nutritional status of the apparently normal person. If specific signs of deficiency, such as signs of protein or vitamin deficiency, are absent, there are no means, clinical or biochemical, that are accurate for all individuals, of estimating how far away these signs of deficiency are. This problem was extensively discussed by Thomson and Duncan in 1954.

It is generally accepted that protein deficiency is a major factor in the development of famine oedema; but the relationship of serum protein variations to deficiency of protein in the diet and the development of oedema is not quite so clear. Nevertheless, serum protein determination has become a recognized method of assessing the state of a person's nutrition (McCance, 1951).

In malnutrition the serum protein contents are reduced, the fraction reduced being the albumin, as the globulin content is often increased in infections (Bruckman, 1930). Leyton (1946) stated that there was a definite relationship between oedema and the fall of plasma protein level, giving the critical level between 5.3 and 4.6 grammes per centum.

Bruckman (1930) stated that oedema developed when the serum albumin level fell below three grammes per centum. Walters (1947) lowered that level to two grammes per centum for the development of oedema, and stated that gross generalized oedema and ascites occurred at a level of one gramme per centum. In contrast, Youmans (1943) found no correlation between the dietary intake of calories or protein and the serum protein levels, and Sinclair (1948), dealing with famine conditions in Holland and

Germany, found serum protein and albumin figures within the normal range in famine oedema. Keys (1950) stated that famine oedema frequently developed when protein concentrations (total and albumin) were well within normal limits. Hypoproteinaemia or hypoalbuminaemia fosters oedema, but is not essential to it. Also, the plasma protein level has to be interpreted with care in evaluating a person's nutritional status, and is subject to many normal fluctuations.

Despite these contradictions or apparent contradictions to the value of serum protein estimations in the assessment of nutrition, it can be safely said that with the numbers examined in this survey, if protein deficiency was at all prevalent we should have seen a greater fall in the serum albumin levels from the white controls, even though many might remain in the normal range, and we should see more evidence of nutritional oedema than the few mild cases of oedema in infants already noted. Should the general nutritional status be still less critical, we should expect to find trouble only in sections of the population which are under-privileged or subjected to special stress. As examples of these, we have taken nursing mothers, and the aged and infirm. Haemoglobin values and the serum protein values of nursing mothers and the aged and infirm seen in this survey compare favourably with those of the general population, and give no indication of deficiency. In addition to the satisfactory serum protein and haemoglobin findings, the blood films gave no indication of deficiency or nutritional anemias.

The joint FAO-WHO Expert Committee on Nutrition, in its report to the Fourth World Health Assembly (1951), gave a rough classification of degrees of nutritional deficiency. Abbreviated they are as follows: (i) Mild deficiency: oedema neither marked nor common, plasma proteins 5 to 5.5 grammes per centum and haemoglobin value in the region of 12 grammes per centum; signs of mild vitamin deficiency. (ii) Moderate deficiency: slight to moderate oedema common; plasma proteins 4.5 to 5.0 grammes per centum, and haemoglobin value 10 grammes per centum; more definite signs of vitamin deficiency. (iii) Severe deficiency: mild to moderate dependent oedema and mild anaemia; plasma proteins below 4.5 grammes per centum and haemoglobin value less than 10 grammes per centum; oedema of considerable degree unless there is dehydration; vitamin deficiencies indicated by pronounced signs and symptoms.

Of the 134 haemoglobin estimations made in this survey, the lowest figures came from three lactating mothers; they fell between 11 and 12 grammes per centum. Even if we take into consideration the high reading in the method employed and make allowance for it, we find that in only 16 more instances did the figure fall below 13 grammes per centum. Of these subjects, nine were children and three were lactating mothers.

Of the 137 serum protein estimations made, the lowest figure was 6.2 grammes per centum. It is evident, then, that by the standards suggested by the Expert Committee on Nutrition there is but little evidence of even a mild deficiency in the diet of the natives.

The few cases of spongy gums, presumably mild vitamin C deficiencies, occurred in town or mission areas. This condition was not seen in natives entirely dependent on

their own foraging in the bush for their food. It is possible that too much reliance was being put on rations from the missions, and that foraging for berries, etc. had been receiving less attention where more sophisticated rations were available.

Kwashiorkor.

Seven out of 49 infants between the ages of one and three years had slight oedema. The affected infants were on a station, at the township of Laverton, and at a mission. As no cases were seen among the natives entirely dependent on their own hunting and foraging, it is likely that the dietary deficiency arose from ignorance and too great a dependence on flour and sugar rations, and that it was a pure protein rather than a calorie deficiency.

In this connexion it is interesting to note that native flour made from crushed mulga seeds examined in the Government Chemical Laboratory was found to have a protein content of 21.3%, compared to 9.2% in our white flour.

The condition has been seen in native infants in north-west towns and is a mild form of kwashiorkor. The general picture presented is as follows. A child, aged between one and two years, has pendulous cheeks, drooping mouth and downcast eyes, and cries on being spoken to (Figure II). The dorsal surfaces of the feet are puffy and pit on pressure. The oedema may spread to the ankles or further, and to the hands and wrists. Some infants show generalized oedema, giving the impression of a fat baby similar to the "sugar baby" of Jamaica.

The oedema disappears and the mental outlook immediately improves on the addition of skim milk powder to the diet (Scrimshaw, 1957).

There is considerable irony in the existence of even these mild cases of protein deficiency in infants in a country with a surplus of skim milk, and while other countries search for cheap substitutes for the valuable skim milk which they cannot afford (Jelliffe, 1955), Australian producers seek to disguise skim milk powder by calling it "non-fat solids" or some such name.

There is an obvious difficulty in the supply of suitable protein to the infant during the weaning period in a country devoid of domestic animals and poultry to provide milk and eggs. The infant has a somewhat hazardous time between weaning and the time when he can masticate and digest semi-cooked kangaroo. He is assisted in crossing this gap by the prolonged lactation of the mother and the late weaning of the infant. Late weaning is essential for the survival of the infant under such conditions, and prolonged lactation is in itself evidence of the adequacy of the mother's diet, as shortage of food reduces the quantity of milk and the duration of lactation (Joint FAO/WHO Expert Committee, 1953).

In common with most races living under primitive conditions, the aboriginal has no suitable dietary supplement to offer the weaning child until it is old enough to do full justice to the food of the tribe. Signs of dietary deficiency are therefore apt to appear at that age. However, they do not indicate a general condition of starvation or even a lack of food, but merely show that suitable food for the infant after weaning does not exist.

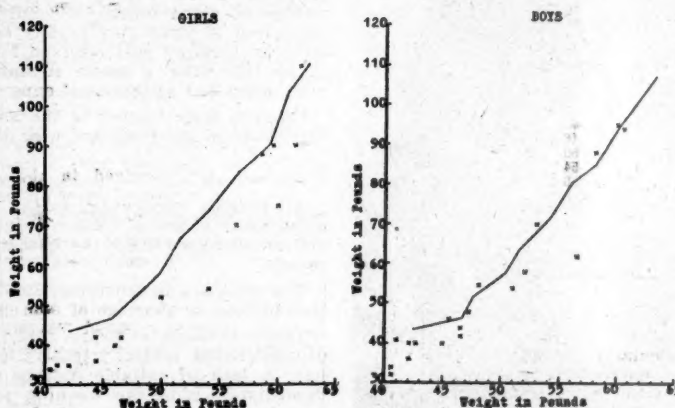


FIGURE I.

Graphs to show the height-weight relationship of Western Australian children aged five to fourteen years. The height-weight relationship of native children (Table I) is shown as points scattered around the graphs.

No permanent ill seems to come from it. The average hemoglobin value in 30 children was 13.4 grammes per centum, the lowest being 12 grammes per centum, and of 23 serum protein estimations made in children, the average figure was 7.3 grammes per centum, the serum albumin content being 3.64 grammes per centum. No clinical evidence of liver damage was obtained during the survey apart from one specimen of serum indicating slight jaundice and one child with a palpable liver. Cirrhosis of the liver is not a common complaint among natives as far as can be ascertained from their admission to hospitals in Western Australia.



FIGURE 11.

The kwashiorkor face in a Warburton Range infant.

Vitamin B₁₂

The high figures obtained for vitamin B₁₂ require further investigation. As animal protein is the main source of this vitamin, it is obvious that the figures recorded by Davis and Pitney (1954) indicate that there was no lack of animal protein in the diet of those surveyed.

Gamma Globulin and Eosinophilia.

High gamma globulin levels have been associated with cirrhosis of the liver and protein malnutrition (Anderson, 1951), but in such cases the total serum protein levels are low.

The significantly high serum protein level of the aboriginal due to the abnormally high gamma globulin fraction needs further investigation. Dean (1953) refers to the role of frequent infection as a cause of high gamma globulin level, and this must be a possibility if we bear in mind the native's disregard of sanitary principles and his consequent frequent contact with infection.

The eosinophilia may be an indication of parasitic infestation; but its geographic distribution suggests that there may be a dietary factor in it.

Comment.

No correlation was found between abnormalities in the vitamin B₁₂, gamma globulin and eosinophilia estimations.

There was also no correlation in the amounts of plasma proteins between comparable nutritional areas; this suggests that there is little real significance in the differences shown.

There was no ophthalmological evidence of dietary deficiency (Mann, 1957).

Disease.

Yaws and trachoma present very similar problems. Both, in the population under review, are prevalent, but cause little inconvenience. Both diseases are highly infectious, particularly in the younger age groups, and there is no acquired immunity, although there seems to be a resistance to yaws which reduces the incidence of flamboyant disease. This resistance may be a racial characteristic, or it may be the effect of a dry climate, a noticeable influence in some countries (Hill, 1953).

Indiscriminate exhibition of penicillin in the treatment of yaws is not without danger of producing resistant strains of other organisms, and the patient treated for and cured of yaws may readily become reinfected. Treatment is therefore best reserved for (i) lesions demanding it, or (ii) when a whole community can be treated or (iii) when the patient is leaving the infected community.

Freedom from leprosy of the natives examined suggests that there is little contact with natives in the far north.

CONCLUSION.

All natives were examined at places where there was no shortage of water. Hemoconcentration from dehydration did not therefore affect the hematological and biochemical results.

The clinical and laboratory findings do not indicate any lack of food or shortage of first-class protein.

There is some evidence that, in common with other peoples living under primitive conditions, these natives have a lack of suitable dietary supplements during and immediately after the weaning period. This deficiency is accentuated by the use of flour and sugar rations, as substitutes for native prepared flours. It should here be noted that the Native Welfare Department has recently included high extract flour and skimmed milk powder in the ration of native children.

Yaws and trachoma, although prevalent, rarely cause incapacity. There seems to be a relative freedom from sepsis and from evidence of intestinal infection, despite extremely poor sanitary habits and poor appreciation of hygiene. This insanitary mode of life may have an effect on the serum gamma globulin level.

High serum gamma globulin and vitamin B₁₂ levels and the frequent eosinophilia require further investigation.

SUMMARY

A brief medical and ophthalmological survey of natives in the Warburton Range area has been carried out. The results, including reference to hematological and biochemical findings, are given, and some conclusions are drawn.

ACKNOWLEDGEMENT.

The V.D.R.L. slide tests were carried out in the Public Health Laboratories under the direction of Dr. N. Kovacs.

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SOME HÆMATOLOGICAL OBSERVATIONS ON ABORIGINES IN THE WARBURTON RANGES AREA.¹

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THE recent visit of a medical party to the Warburton Ranges area (Davidson, 1957) provided an opportunity to obtain some hematological values from this group of aborigines. One of us (R.E.D.) travelled with the party and obtained as many blood samples as possible. Some preliminary observations on these samples were carried out in the field; further investigations were performed when the specimens arrived in the Department of Hematology, Royal Perth Hospital.

Methods.

The Warburton Ranges area is hot and most inaccessible, and available refrigeration facilities consisted of a single refrigerator at the Warburton Mission. As it was not practical to transport heavy laboratory equipment, blood specimens remained at air temperature for several days before they were received in Perth. Autolysis of specimens was minimized by collecting venous samples only and carrying out initial processing in the field with sterile precautions.

Ten-millilitre blood samples were withdrawn with vitamin B₁₂-free sterile syringes. The aborigines were most cooperative in submitting to vein puncture; on two occasions a protest was raised that an individual had been passed over when a group was examined. Four millilitres of blood were mixed with eight milligrammes of the dry

dipotassium salt of sequestrene (ethylenediamine tetra-acetic acid) as anticoagulant in a sterile container. We have found the dipotassium salt, because of its much higher solubility, to be a more satisfactory anticoagulant than the disodium salt, as claimed by Hadley and Weiss (1955). The remaining six millilitres of blood were allowed to clot in another sterile container. Two thin blood films were made at the time of blood collection, numbered and immediately fixed in methanol for 10 minutes. These were then packed for transmission and subsequent staining in the Perth laboratory.

When time allowed at the end of each collection period, hæmoglobin estimations were carried out on the fluid blood specimens by the use of a M.R.C. grey-wedge photometer (King, Wootton, Donaldson, Sisson and Macfarlane, 1948) with daylight illumination. This instrument is frequently calibrated against a blood sample of known hæmoglobin value supplied at regular intervals by the New South Wales branch of the Australian Red Cross Society. As soon as clot retraction was adequate in the clotted specimens, serum was separated from the clot into another sterile container by the use of a sterile Pasteur pipette.

As opportunity presented, blood samples were delivered to the laboratory in Perth. Specimens collected early in the investigation were received two days later. Those collected at the Warburton Mission were kept in the mission refrigerator until the party passed through on their return to Perth. Samples collected on the Blackstone and Rawlinson Range areas had to remain at air temperature for several days. The longest interval for which blood was kept without being cooled before its receipt in Perth was eight days. Samples stored in the Warburton Mission refrigerator were not received until 12 days after collection.

As each batch of blood samples was received in the laboratory, the fluid specimens were checked visually for hæmolysis and hæmoglobin denaturation. The samples varied considerably in their state of preservation. Some hæmolysis was apparent in most specimens, but the blood oxygenated well on being shaken. In a few specimens hæmoglobin denaturation had taken place. The apparent hæmoglobin values of all samples were immediately recorded by the use of an oxyhæmoglobin method and a Gallenkamp photo-electric colorimeter fitted with a yellow-green filter (Ilford No. 625). The standard used with this instrument is a neutral grey density screen, the hæmoglobin equivalent of which is checked against a blood sample of known hæmoglobin value supplied at regular intervals by the New South Wales branch of the Australian Red Cross Society.

Blood films were stained by the May-Grünwald-Giemsa technique at pH 6.8 (Dacie, 1956). They were examined microscopically especially for morphological red cell abnormalities. The percentage of eosinophil polymorphonuclear leucocytes was estimated in each film.

The serum samples were centrifuged to free them of suspended red cells, and were then divided into aliquots for serum protein estimation, serological examination and vitamin B₁₂ assay. Samples for vitamin B₁₂ assay were stored at -20° C. Serum samples were mostly received in good condition. Most specimens were visually clear and showed no protein precipitation. We attribute this to the procedure of separating serum in the field.

The serum vitamin B₁₂ content was estimated microbiologically, *Euglena gracilis* var. *bacillaris* being used as test organism (Ross, 1952).

Results.

Hæmoglobin Values (Field Estimation).

Hæmoglobin estimations were carried out in the field on a total of 59 aborigines; 29 were from the Laverton native camp, 18 from the Cosmo Newbery area and 12 from the Warburton area. Twelve of the 59 samples were from children between the estimated ages of six years and 14 years. The remainder were from adults.

An adult male at the Laverton camp had a hæmoglobin value of 4.2 grammes per centum. This man had symptoms of severe anemia, and subsequent examination of a blood

¹Expenses associated with the serum vitamin B₁₂ assays were partly defrayed by a grant-in-aid from The Royal Australasian College of Physicians.

film showed this to be of the iron-deficiency type. The subject had recently given copiously of his blood at a corroborree ceremony. His haemoglobin value is not included in subsequent analyses. The haemoglobin values of the remaining 58 are shown in Table I.

TABLE I.

The Range and Mean of Haemoglobin Values Obtained from 58 Aborigines Using the M.R.O. Grey-Wedge Photometer.

Subjects.	Haemoglobin Value. (Grammes per Centum.)		
	Minimum.	Maximum.	Mean.
Adults (46)	11.8	17.9	14.4 S.D.=1.9
Children (12)	11.8	14.5	12.8 S.D.=0.9

Haemoglobin Values (Laboratory Estimation).

Haemoglobin estimations were carried out in the laboratory on a total of 134 blood specimens including the 58 checked in the field. The range and mean values for individuals in the various areas are shown in Table II.

TABLE II.

The Range and Mean of Haemoglobin Values Obtained on Blood Received in the Laboratory from 134 Aborigines.

Location.	Number of Subjects.	Haemoglobin Value. (Grammes per Centum.)		
		Minimum.	Maximum.	Mean.
Laverton	29	12.7	19.5	15.9 S.D.=2.0
Weld Station	13	12.0	17.9	14.2 S.D.=1.6
Cosmo Newbery	20	11.9	17.9	14.5 S.D.=1.7
Warburton Mission	36	11.6	17.8	14.1 S.D.=1.4
Blackstone	15	11.7	18.7	15.1 S.D.=2.1
Giles	21	12.5	19.5	14.5 S.D.=1.7
Total	134	11.6	19.5	14.7 S.D.=1.7

Included in the table are haemoglobin values from 26 lactating women, from 30 children between the estimated ages of six and 14 years and from 10 individuals classified by Davidson (1957) as either senile or physically handicapped. These figures are shown separately in Table III. Values for adult males and adult females (excluding lactating women) are given in Table IV.

The 58 values obtained in the field were compared with the corresponding laboratory values for the same blood samples. The mean laboratory value for these samples was 15.0 grammes per centum, compared with the mean field value of 14.0 grammes per centum. The standard error of the difference between the two means is 0.35, which indicates that the increased value recorded in the laboratory is significant. The difference does not seem to be due to observer error. One of us (R.E.D.) consistently obtains close correlation between duplicate haemoglobin estimations in the laboratory on fresh blood samples using both the grey-wedge photometer and the Gallenkamp photo-electric colorimeter. It seems probable that denaturation of blood samples in transport was responsible

for the slightly higher laboratory values for haemoglobin obtained in these 58 samples.

Blood Film Examinations.

Apart from the individual who suffered from iron-deficiency anaemia, there was no red cell morphological abnormality in any of the 145 blood films studied. The

TABLE III.

Haemoglobin Values Estimated in the Laboratory from Lactating Women, Children and Senile and Physically Handicapped Individuals.

Subjects.	Haemoglobin Value. (Grammes per Centum.)		
	Minimum.	Maximum.	Mean.
Lactating women (26)	11.6	18.2	13.7 S.D.=1.4
Children (30)	12.0	15.5	13.4 S.D.=0.3
Senile and handicapped persons (10)	15.0	17.9	16.3 S.D.=0.9

group includes adults, lactating women and children. Films from the lactating women were especially searched for macrocytosis and those from the children for hypochromia, but all were uniformly normal.

Eosinophilia.

Total leucocyte counts were not performed at the time of blood collection. From film appearances, no obvious examples of either leucopenia or leucocytosis were encountered. In the examination of the films, eosino-

TABLE IV.

Haemoglobin Values Estimated in the Laboratory from Adult Aboriginal Males and Females.

Subjects.	Haemoglobin Value. (Grammes per Centum.)		
	Minimum.	Maximum.	Mean.
Males (51)	13.0	19.5	16.2 S.D.=1.8
Females (27)	12.5	16.9	14.5 S.D.=1.2

philia was noted on numerous occasions. The degree of eosinophilia is indicated in Table V. One individual showed an eosinophilia of 16%.

To determine whether eosinophilia was more common in any particular group, individuals with eosinophilia greater than 6% have been classified according to the area in which they were examined. These results are shown in Table VI.

Serum Vitamin B₁₂ Values.

The vitamin B₁₂ levels of 140 specimens of serum were estimated. The values obtained ranged from 160 to 2512 micro-microgrammes per millilitre ($\gamma\gamma$ /ml.). A statistical analysis of the range of serum B₁₂ values in a large group of normal white people living in the Perth area as estimated by this laboratory is at present in preparation. The normal range is approximately 100 to 600 $\gamma\gamma$ /ml. This compares well with the normal ranges found by others using the Euglena technique (Mollin and Ross, 1954; Pitney and Beard, 1954; Killander, 1953; Lear, Harris, Castle and Fleming, 1954; Uchino, 1957). No example of low serum vitamin B₁₂ level was found in any of the sera examined.

In 77 of the 140 sera the vitamin B₁₂ concentrations were within the range of 100 to 600 $\gamma\gamma$ /ml. In the remaining

63 sera the values were abnormally high; in 51 the values ranged from 600 to 1200 $\gamma\gamma$ /ml., and in 12 from 1200 to 2512 $\gamma\gamma$ /ml. The Euglena assay method is able to distinguish between vitamin B_{12} bound to serum protein and that existing free in the serum. In these sera, vitamin B_{12} was present mostly in bound form; values of free vitamin greater than 160 $\gamma\gamma$ /ml. were found in only four specimens of serum.

The 63 specimens showing abnormally high serum vitamin B_{12} values were classified according to the areas from which the specimens of blood were collected. The results are shown in Table VII. The incidence of high

TABLE V.
Percentage of Eosinophils in Blood Films from
145 Aborigines.

Number of Films.	Eosinophil Percentage.
79	0 to 3
35	3 to 6
27	6 to 10
4	Greater than 10

serum vitamin B_{12} values varied widely in different localities. Of the 18 sera examined from the Blackstone Ranges area, 15 showed vitamin B_{12} values greater than 600 $\gamma\gamma$ /ml., whereas only one of 13 sera from Weld Station showed a level above the normal range. There was no obvious correlation between high serum vitamin B_{12} values and the age and sex of the subjects from whom the blood was collected. Of 53 adult males, 26 showed high serum vitamin B_{12} values. The corresponding figures for adult females were 25 of 54 and for children 12 of 33.

TABLE VI.
Regional Classification of Eosinophilia on Blood Film Examination.

Location.	Number of Films.	Films with Greater than 6% Eosinophils.
Laverton	31	2
Weld Station	13	4
Cosmo Newbery	22	4
Warburton Mission	35	10
Blackstone	20	8
Giles	24	3

Discussion.

The haemoglobin values reported in this paper indicate that anaemia is rare among the aborigines living in the Warburton Ranges area. It was not considered practical to perform vein punctures on very small children, and the possibility has not been excluded that anaemia may exist below the age of six years. However, the satisfactory haemoglobin values found in older children make this unlikely. The investigation was limited to one particular time of year, and does not exclude the possibility that a seasonal incidence of nutritional anaemia may exist. This seems unlikely, since the survey was carried out in February and March, which are towards the end of the dry season when nutritional deficiencies, if they did occur, would be expected to become manifest.

We have not been able to find a comparable survey of haemoglobin values in Australian aborigines to compare with our figures. In a recent survey among the healthy white population of New South Wales, Walsh, Arnold, Lancaster, Coote and Cotter (1953) found mean values for

haemoglobin of 15.7 grammes *per centum* for males and 13.9 grammes *per centum* for females. For children, values are lower. British figures indicate a mean of 12.9 grammes *per centum* for 10-year-olds (Dacie, 1956). By these standards there was no anaemia found in this survey except for the blood donor at Laverton Camp.

Unfortunately it was not possible to perform field haemoglobin estimations on more than 58 subjects. There was limited time available for these investigations, as it was necessary for the medical party to keep to a schedule. For 76 individuals, laboratory figures only for haemoglobin values are available. It appears that the laboratory figures are slightly higher than the true haemoglobin values, owing to deterioration in fluid blood samples in transport. The difference of one gramme *per centum* in the mean values of the 58 blood samples in which duplicate observations were made indicates that the laboratory values for the other 76 are sufficiently accurate for general inferences to be made.

TABLE VII.
Regional Classification of Sera Showing Abnormally High Vitamin B_{12} Values

Location.	Total Number of Sera Assayed.	Number of Sera with High Vitamin B_{12} Values.
Laverton	32	19
Weld Station	13	1
Cosmo Newbery	21	3
Warburton Mission	35	13
Blackstone	18	15
Giles	21	12

Of 140 sera, 63 (45%) showed abnormally high serum vitamin B_{12} values. Values greater than normal have been reported so far in patients with myeloid leucæmia (Beard, Pitney and Sanneman, 1954) and other myeloproliferative disorders (Mollin and Ross, 1955), and in patients with viral hepatitis and hepatic cirrhosis (Lear and co-workers, 1954; Jones and Mills, 1955; Rachmilewitz, Aronovitch and Grossowicz, 1956; Kristensen, 1956). In myeloid leucæmia the elevated vitamin B_{12} levels are due almost entirely to an increase in the amount of bound vitamin in the serum. Elevated vitamin B_{12} levels in liver disease are due to an increase in bound vitamin, which in some instances is accompanied by an increase in free values. Vitamin B_{12} is bound normally to a fraction of serum having the electrophoretic mobility of alpha globulin (Pitney, Beard and Van Loon, 1954). Although the patients with liver disease usually have abnormal serum protein patterns, no correlation has been found between the elevated vitamin B_{12} levels and abnormalities in the alpha globulin fractions (Rachmilewitz and co-workers, 1956).

The elevated serum vitamin B_{12} values reported in this paper were due mostly to an increased level of bound vitamin. This suggests an abnormal increase in the amount of vitamin B_{12} binding protein in the sera, since normal serum has a limited capacity to bind vitamin B_{12} . There was no evidence of leucæmia or other myeloproliferative disorder in any of the blood films examined. Likewise we have found no hematological evidence to suggest that liver disease is common in the area. Serum bilirubin examinations were not performed; but except for one specimen of serum from a native at Laverton Camp, icterus was not noticed in any of the samples. The blood films did not show macrocytosis. The high incidence of elevated serum vitamin B_{12} values in subjects from the Blackstone Ranges area in contrast to some other groups suggests the importance of a geographical factor. Eosinophilia was also more common in the Blackstone group, but there seems to be no relation between eosinophilia and raised serum vitamin B_{12} levels in the population as a whole.

Summary.

A haematological investigation was performed on aborigines in the Warburton Ranges area. Haemoglobin values compared favourably with results obtained from control studies in white communities. Red cell morphology as interpreted from stained blood films was normal. A considerable proportion of the blood films showed eosinophilia. There was no evidence of vitamin B₁₂ deficiency as determined by serum vitamin B₁₂ assay; in 45% of sera abnormally high vitamin B₁₂ levels were found. The significance of this finding is discussed.

Acknowledgements.

The large number of blood samples which arrived together and the subsequent processing necessitated that this project be carried out by the Department of Haematology, Royal Perth Hospital, as a unit. Without the time donated voluntarily by all members of the department, the investigation would not have been possible. Acknowledgements are especially due to Miss D. Nicholas, B.Sc., Dip. S.L.T.A., who performed most of the serum vitamin B₁₂ assays, and to Mr. J. Neal, A.I.M.L.T., for the organization of the staff to stain blood films and estimate the haemoglobin values.

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THE SERUM PROTEINS OF ABORIGINES IN THE WARBURTON RANGE AREA.

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SERA from a number of aborigines of the Warburton Ranges were made available to this laboratory by the medical party which recently visited the area (Davidson, 1957). The total protein concentration and the electrophoretic distribution of proteins of these sera were determined.

Material and Methods.

The collection of blood and separation of serum are described by Davis and Pitney (1957). There is no reason to believe that the delay in refrigerating sera significantly affected the protein levels or distribution subsequently found, although this possibility is noted.

Twenty control sera were obtained from healthy white laboratory staff members, whose ages ranged from 18 to 55 years.

The total protein content was estimated by the copper sulphate specific gravity method (Phillips *et alii*, 1945).

Electrophoresis on paper was carried out, with a Flynn and de Mayo (1951) apparatus, on Whatman three millimetre paper, with the use of the following factors: barbitone buffer pH 8.6, μ 0.05, 70 volts for 17 hours. The papers were dried at 110°C. for 45 minutes, stained with azocarmine B (0.1% in methanolic acetic acid) and washed with 10% acetic acid until the background cleared.

The patterns were scanned with a "JLC Model 3SR" reflectance densitometer, the 5 x 1.5 millimetre slit and "red" photocell being used. Areas under the curve were determined with a planimeter, and concentrations of protein fractions were calculated directly from these areas and the total protein values. This method gives results for normal sera essentially the same as those of other workers—e.g., Henry *et alii* (1957), Sunderman and Sunderman (1957), Neely and Neill (1956) and Conn and Klatskin (1954).

Results.

Serum Proteins of the Aborigines.

The values found for the protein fractions in the sera of 134 aborigines are shown in Table I, together with those of the controls.

Differences between the two groups lie in the higher total protein and γ -globulin contents of the aborigines' serum, while the albumin, α -globulins and β -globulin contents show no significant differences.

Variation of Serum Proteins with Living Conditions.

In order to detect possible effects of living conditions on serum proteins, the aborigines were divided into the eight groups shown in Table II. These are based on Davidson's assessment of "nutritional environment", and are listed in the expected order of decreasing standard of nutrition.

The mean values for total protein, albumin and γ -globulin shown in Table II indicate that differences exist between the groups, but there is no apparent correlation with environmental classification.

Discussion.

The finding of high total protein, normal albumin and high γ -globulin concentrations in the sera of aborigines of the Warburton Ranges area is difficult to interpret with the data at present available. The lack of correlation between serum protein concentrations and "nutritional environment" is discussed by Davidson (1957).

There are many reports on the serum protein levels in cirrhosis and in malnutrition. Sunderman and Sunderman (1957), for example, found a mean albumin concentration of 2.31 grammes per 100 millilitres and a γ -globulin concentration of 2.33 grammes per 100 millilitres in 21 patients with cirrhosis. In malnutrition Anderson and Altmann (1951) reported decreased albumin and increased γ -globulin levels, Peters *et alii* (1926) decreased total proteins, and Walters *et alii* (1947) decreased total protein and albumin levels and increased globulin level, while in hunger oedema Denz (1947) found lowered total protein and albumin concentrations. In the present study the aborigines show increased γ -globulin levels of moderate degree, but not the lowered albumin levels which might have been expected if the subjects were suffering malnutrition. The γ -globulin levels, however, are in line with those found in Netherlands New Guinea natives by Luyken *et alii* (1956) and in various Pacific island natives and aborigines of Darwin by Brading (personal communi-

TABLE I
The Serum Protein Concentrations of Aborigines.

Subjects.	Number.	Concentration (Grammes per 100 Millilitres).					
		Total Protein.	Albumin.	α_1 Globulin.	α_2 Globulin.	β Globulin.	γ Globulin.
Aborigines	134	—	—	—	—	—	—
Mean	—	7.56	3.78	0.20	0.76	0.96	1.88
Standard deviation	—	0.51	0.43	0.08	0.25	0.21	0.49
White controls	20	—	—	—	—	—	—
Mean	—	7.05	3.96	0.16	0.73	0.96	1.24
Standard deviation	—	0.44	0.32	0.06	0.11	0.17	0.22
P	—	<0.001	—	—	—	—	<0.001

cation). It is possible that an explanation of these findings lies in the dietary pattern of the natives. Further study in various age groups, including very young children, is required to establish a correlation between the serum protein levels and dietary history.

However, racial factors should not be overlooked. High γ -globulin levels have been observed in North American negroid individuals by Long *et alii* (1956) and by Rawnsley *et alii* (1956). Milam (1946) found lowered albumin and increased globulin levels in Negroes, and Vera and Roche (1956) reported high γ -globulin concentrations in apparently normal persons in Venezuela.

TABLE II
Serum Protein Concentrations of Aboriginal Groups.

Group.	Conditions.	Number of Subjects.	Serum Protein Content. (Mean Values—Grammes per 100 Millilitres.)		
			Total.	Albumin.	γ -Globulin.
Weld Station	Station natives.	11	7.85	3.66	2.18
Laverton	Native camp—casual labour.	28	7.64	3.95	1.77
Cosmo Newbury	Mission natives and natives from adjacent camp.	17	7.36	3.55	2.08
Warburton		19	7.58	3.88	1.93
Blackstone	Entirely dependent on hunting and foraging.	9	7.37	3.82	1.60
Rawlinson		16	7.18	3.56	1.65
Lactating mothers	—	25	7.66	3.81	1.88
Aged and infirm	—	9	7.91	3.83	2.10

The possible role played by acute or chronic infection in the production of the abnormal protein pattern in these aborigines is impossible to assess without a much more detailed clinical study of the group. However, the absence of increases in α_2 -globulin or β -globulin casts doubt on this possibility.

Summary.

The concentration and electrophoretic distribution of the serum proteins of 134 aborigines of the Warburton Ranges have been determined and compared with the protein pattern of control white individuals.

High total protein and γ -globulin concentrations were found in the aborigines as compared with the controls.

The significance of these findings is discussed.

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REPORT ON OPHTHALMIC FINDINGS IN WARBURTON RANGE NATIVES OF CENTRAL AUSTRALIA.

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AN examination of the anterior segment of the eye, and in a number of cases of the visual acuity, was carried out in conjunction with the general medical examination described by W. S. Davidson (Davidson, 1957). Five hundred and six persons were examined, including 49 white persons who requested it. This report deals with 438 natives who were investigated as follows. In each case the upper lid was everted and the lids, conjunctiva, cornea, iris and pupil were examined, focal illumination being used where necessary; ophthalmoscopy was used only where there was a definite indication, as we were looking mainly for trachoma and other forms of conjunctivitis and for ocular signs of malnutrition. These easily observable signs of an unbalanced diet comprise the following:

1. Bitot's spots, xerophthalmia, keratomalacia and night blindness Vitamin A deficiency.
2. Diminished visual acuity, nystagmus, cracked and red skin at the canthi and on the lids; central colour scotoma Vitamin B₁ deficiency.
3. Circumcorneal vascularization spreading on to both corneas all round the limbus, corneal opacities around a central clear area, cracks at the outer canthi, photophobia and lachrymation Vitamin B₂ deficiency.
4. Subconjunctival, orbital and lid hemorrhages Vitamin C deficiency.
5. Phlyctenular disease Malnutrition and possible tuberculosis.

Trachoma.

A previous ophthalmic survey of this region had been carried out in 1954 by me (Mann, 1954a), and at that time the incidence of trachoma was between 47% and 71% (47% at Mount Margaret, 69% at Cosmo Newbery, and 71% at the Warburton Mission). The type was then found to be mild, without much secondary infection, and the rate of complications and of blindness was low. Dr. Percy White carried out a general medical examination at that time, and our impression of the natives was that they were very healthy (Mann, 1954a), though there were some cases of yaws.

During the present survey many of the same persons were examined. Of the 438 natives, 190 had been examined in 1954. Sixteen of these had contracted trachoma since 1954, but on the other hand 12 had been cured since 1954 and five much improved by treatment. The new infections were largely in very young children.

The 1954 and 1957 incidence and activity of trachoma in the areas visited are shown in Tables I and II.

In Table II the classification of the stages of trachoma followed is that based on function as suggested by the World Health Organization as follows:

- Trachoma Stage A: Active and infectious with follicles.
Trachoma Stage B: Healed with good sight. Scars and no follicles.
Trachoma Stage C: Healed with impaired sight.
Trachoma Stage D: Blind from trachoma (i.e., so blind as to be unable to perform work for which eyesight is essential).

The 1957 figures concern 438 natives examined ophthalmologically, and exclude the incomplete records of 49 white persons and 19 natives examined on a station.

Of these 438 persons, 277 received a general medical examination as well from Dr. Davidson, and 147 had blood taken by Mr. Richard Davis. The findings have been described in the preceding papers.

Of these 277 persons, 145 were given tests for visual acuity and colour vision, in addition to the objective ophthalmological examination.

It will be seen that in 1957 the Blackstone and the Rawlinson Ranges were visited for the first time, but it must be remembered that these people are nomadic, and in actual fact locality has little meaning. For example, natives examined at the Warburton Ranges in 1954 were encountered at both the Blackstone and the Rawlinson Ranges (19 at Blackstone and 12 at Rawlinson), so that we are really dealing with the same group of people scattered over a wide area.

It would appear at first glance from the tables that the trachoma situation has worsened between the two surveys; but the figures are not sufficiently comparable or large to be certain of this. For example, the rise in active trachoma at Cosmo Newbery from 10% to 55% is due to the fact that in 1954 only nine persons under the age of twenty years were examined, while in 1957 more than double the number were examined in this, the age group which always contains the majority of active cases. Also, only 29 persons altogether were examined there in 1954 and 41 in 1957. Further, in the case of Mount Margaret Mission, the rise in incidence of active trachoma from 46% to 60% is due to the fact that 44 persons with untreated trachoma had joined the mission since our last visit. This demonstrates the need for immediate treatment of all new entrants to mission schools, without waiting for a departmental inspection.

The tables also bring out the known fact that the active infectious stage of trachoma is much more common in children than in adults, and that the need for treatment of uncomplicated trachoma diminishes rapidly over the age of twenty years. This gives us hope that by continual treatment of all new entrants to schools and of all children after a long "walk-about", the infection rate in time will drop. Treatment of nomadic natives of adult age is virtually impossible. Most of them have the disease in the healed, quiescent stage, and only a few suffer from late complications in this region. Indeed, only seven persons out of the 337 with signs of present or past trachoma were found with any ocular disability. Four had trichiasis, and three had grossly impaired sight (visual acuity 6/60) and so were technically blind, but were able to get around unaided. (One of these had been examined in 1954.) This rarity of late complications (as compared with the Kimberleys, where they are more common—Mann, 1954b) is due to the small amount of secondary infection. Of the 337 subjects with trachoma examined, only 16 had clinical evidence of accompanying bacterial conjunctivitis, and 13 of these were young children. This is remarkable, as these people mostly live in conditions of squalor, without soap or water, and surrounded by flies. The explanation probably lies in the fact that the groups are small, that they wander freely over large areas of bush, and that the extremely dry climate and large amount of sunlight are inimical to the perpetuation of septic infections. Indeed, sepsis in any form is rare, and no case of marginal blepharitis or styes was found. One Melbomian abscess was seen in a mission, and the 16 cases of conjunctivitis were not severe. It is well recognized, of course, that the severity of trachoma and the seriousness of its sequelae depend almost entirely on the presence of secondary sepsis.

Other Eye Diseases.

Table III shows the nature and age incidence of the other diseases of the anterior segment of the eye found in these 438 persons. The 16 secondary infections are not included here.

There is not much of interest here except the three cases in which the ocular condition was typical interstitial keratitis, but the Wassermann reaction was negative. It is debatable whether interstitial keratitis occurs in yaws, but even so one would have expected a positive Wassermann reaction. These cases are unexplained. In the case of judicial blinding there was complete symblepharon with metaplasia of corneal epithelium, such as might follow from a chemical burn or from severe pemphigus. There were no other signs of pemphigus, and the story was told

TABLE I.
Incidence of Trachoma in Age Groups in Coloured and Full-Blood Natives.

Place.	0 to 9 Years.		10 to 19 Years.		20 to 29 Years.		30 to 39 Years.		40 to 49 Years.		50 to 59 Years.		Over 60 Years.		Total.		Percentage of A.	Active Trachoma.	Secondary Infection.
	E. ¹	A. ¹	E.	A.	E.	A.	E.	A.	E.	A.	E.	A.	E.	A.	E.	A.			
1954:																			
Laverton ..	29	21	22	12	21	9	19	10	11	5	5	3	1	—	108	60	56	28	—
Mt. Margaret ..	61	34	52	24	17	9	14	3	6	2	11	6	10	3	171	81	47	37	—
Cosmo Newbery ..	4	2	5	3	3	1	1	1	6	5	6	5	4	3	29	20	69	2	—
Warburton Mission	77	67	48	35	28	16	24	8	16	11	12	9	28	20	233	166	71	83	—
Total ..	171	124	127	74	69	35	58	22	39	23	34	23	43	26	541	327	60	150 (46%)	—
1957:																			
Laverton ..	29	14	8	7	13	7	10	5	3	1	7	6	—	—	70	40	58	18	2
Mt. Margaret ..	69	54	33	25	11	10	1	—	1	—	—	—	—	—	115	89	78	54	—
Cosmo Newbery ..	17	17	5	5	3	2	2	2	6	4	4	4	2	2	41	38	93	21	6
Warburton Mission	59	48	19	17	10	7	12	8	6	4	2	—	6	4	114	88	77	57	5
Blackstone Ranges	18	7	7	7	11	9	5	3	5	2	4	5	1	—	51	44	86	29	2
Rawlinson Ranges	20	17	10	9	4	4	6	4	3	2	1	—	—	—	47	38	81	32	1
Total ..	212	168	82	70	53	39	36	22	25	16	19	16	11	6	438	337	77	211 (62%)	16

¹ E, examined; A, affected.

TABLE II.
Incidence of Trachoma in Age Groups in Caste and Full-Blood Natives.

Stage.	1954.								1957.							
	0 to 9 Years.	10 to 19 Years.	20 to 29 Years.	30 to 39 Years.	40 to 49 Years.	50 to 59 Years.	Over 60 Years.	Total.	0 to 9 Years.	10 to 19 Years.	20 to 29 Years.	30 to 39 Years.	40 to 49 Years.	50 to 59 Years.	Over 60 Years.	Total.
A.	112	30	6	—	1	1	—	150	147	41	14	8	—	1	—	211
B.	12	42	27	20	21	15	15	152	21	29	24	13	16	11	5	119
C.	—	2	2	2	1	6	5	18	—	—	1	1	—	1	1	4
D.	—	—	—	—	—	1	6	7	—	—	—	—	—	3	—	3
Total ..	124	74	35	22	23	23	26	327	168	70	39	22	16	16	6	337

me that the blinding was done about eleven years ago as a punishment (? attempted fratricide).

It is of interest to note that the two blind persons (one blind for eleven years and the other from infancy) had been well looked after and appeared in good health. They

TABLE III.
Diseases Other Than Trachoma.

Age. (Years.)	Disease or Injury Found.	Number of Subjects.
0 to 1 ..	Severe infection of skin of face ..	1
1 to 9 ..	Clinical quiescent interstitial keratitis with negative Wassermann reaction ..	1
10 to 19 ..	Spring catarrh ..	1
20 to 29 ..	Infected Meibomian cyst ..	1
	Lid injury ..	1
	Fly bite ..	1
	Divergent squint ..	1
	Clinical interstitial keratitis with negative Wassermann reaction ..	2 (brother and sister)
30 to 39 ..	Blindness from ? chemical injury (judicial) ..	1
	Severe anaemia from coroboree venesection ..	1
	Leucoma from injury ..	1
	Sluggish pupils, unknown cause ..	1
40 to 49 ..	Severe corneal scars causing blindness (not trachoma) ..	1
50 to 59 ..	Blindness in one eye from injury ..	4
60 and over	Early nuclear sclerosis of lens ..	2
	Blindness in one eye from injury ..	1
	Dacryocystitis ..	1

were travelling around with the tribe. It would seem likely that if food was very scarce these blind persons would be the first to suffer. This also applies to the three persons with badly impaired sight from trachoma, who also appeared in good health.

TABLE IV.
Binocular Visual Acuity of 145 Natives.

Visual Acuity.	Number of Subjects.	Age. (Years.)	Stage of Trachoma.	Other Diseases.
< 6/60	3	All over 40	2D 1B	—
6/24	1	35	B	Sluggish pupils, cause unknown.
6/18 to 6/12	3	2 over 50	2B 1C	One interstitial keratitis on clinical grounds, but Wassermann reaction negative.
6/9	9	3 over 45 2 under 15	2N 3A and A-B	—
6/6	10	3 over 45 2 under 15	4B 1N 4A-B	—
6/5	57	9 over 45 22 under 15	5B 11N 30A or A-B	—
9/5	39	4 over 45 12 under 15	16B 8N 13A or A-B	—
12/5	19	1 over 45 3 under 15	18B 7N 5A or A-B	—
15/5	2	Both 20-30	1N 1B	—
17/5	2	1 19 1 21	No trachoma	1 spring catarrh.

The complete absence of blepharitis in all the 294 persons aged under twenty years is also interesting, in view of its common occurrence in white children in Western Australia. However, it is rare in natives in all parts of the State.

Colour Vision.

Colour vision was tested in 145 persons, mostly males. The Ishihara test was used. No case of colour blindness was found. This was consistent with our findings among full-blood aborigines elsewhere in the State (Mann and Turner, 1956).

Visual Acuity.

Visual acuity was tested with the illiterate E test in 145 persons. Each eye was tested separately, sign language being often used, as the test can easily be explained in this way. It was done in daylight in the open air, which makes it rather easier than with standard illumination. The 6/5 line should be read by the normal subject at six metres or a little over. In cases in which this was accomplished and the patients were intelligent enough to make the effort of concentration, they were moved successively back to 9, 12, 15 and 17 metres from the test type. A visual acuity of 12/5 to 17/5 can be regarded as excellent, and greater than that attainable by most Europeans. The results of the test are shown in Table IV, which gives the acuity of the better eye. In the majority it was the same in both eyes, but in some cases one eye had been injured. No myopia was found.

The age distribution and the status of trachoma in the various groups are also shown. The stages A and B of trachoma appear to have no effect on the visual acuity. As among Europeans, the acuity in young children appears slightly less good than in adults; but this is possibly due to some lack of concentration and is of no significance.

Nutritional Status.

No ocular signs of malnutrition or vitamin deficiency were found, even in the five children with spongy gums from early scurvy found by Dr. Davidson at the Warburton Mission. No case of phlyctenular disease was seen.

Summary and Conclusions.

An account is given of the investigation of the ophthalmic condition of 438 caste and full-blood natives examined in the area stretching north-east from Laverton to the Rawlinson Ranges.

Trachoma, though widespread, is not severe, healing spontaneously in the majority of cases. In 62% of cases of trachoma the condition is in the active and infectious stage. The total infection rate of the population is 77%.

The figures found are similar to those published in 1954 as a Western Australian Government Report.

There were no ocular signs of malnutrition.

Certain diseases common among white persons were not encountered at all—e.g., styes and marginal blepharitis, myopia, convergent squint, mucopurulent conjunctivitis, glaucoma, "watercleft" cataract, and colour blindness.

Trachoma apart, the ocular condition of the natives is good.

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ILLNESS IN TWINS: I. A STUDY OF TWINS FROM A GENERAL HOSPITAL POPULATION.¹

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THE use of twins in genetic studies has been discussed by Slater (1953) and by Kallmann (1954). Both these authors have been particularly concerned with mental illness and have made a special plea for the value of twin

studies in this field. In both cases the twins have been sought in a given population of hospital admissions. Kallmann has enhanced the value of his work by comparing the incidence of illness in co-twins with that in other family members—full siblings, half-siblings, step-siblings and spouses—thus making a twin-family study. The purpose of the present paper is to report a study of twins taken from admissions to a general hospital and to discuss the difficulties and limitations apparently peculiar to the population so selected.

The theoretical basis of twin studies is firstly that there are two types of twins. One-egg twins are supposed to come from one fertilized ovum, from which the two daughter cells develop into two separate but genetically similar individuals. Further division may lead to super twins, such as the Dionne quintuplets. Such one-egg twins are also termed monozygous, uniovular or identical. Two-egg twins represent a double pregnancy from the accidental release and fertilization of two separate ova. They are siblings born together instead of a year or more apart. Genetically their resemblance is of the same order as that of siblings, and they may equally be of the same or of opposite sex. Two-egg twins are also called dizygous, binovular or fraternal. The weight of evidence from genetic studies supports this theory of one-egg and two-egg twins (Waterhouse, 1953).

As regards disease, the second theoretical basis is that concordant (similar) behaviour in identical twins will result when genetic factors predominate, and discordance will be due to some difference in environment. There are limiting factors to this simple division of influence. Related to the physiological or embryological aspects of twinning, there may be disturbances of laterality. However, such differences relating to laterality in the embryo are seldom the basis of later disease states. Secondly, there are the accidental phenomena of placentation, position in the uterus, and more important, the events of labour (Price, 1950). Slater (1953) found that the twin whose birth was more difficult was more likely to suffer from later psychiatric illness, or suffered more severely. The third factor is the possibility of vascular differences between identical twins while in utero.

On the other hand, the environment of twins is similar in many respects, and concordance in relation to disease may well be a reflection of this similarity of environment. In this regard Kallmann explicitly states that twins and singletons are alike after birth, and this is clearly essential to his use of the twin method. This aspect of the environment of twins will be referred to later.

Twin studies comparing concordance in identical and non-identical twins must be so carried out that no bias exists in the selection of twins. All the twins in a given population should be ascertained. Many early studies and single case reports showed that concordance was the main reason for the reporting, and doubtful conclusions followed (Luxenburger, 1930).

In the present study, patients on admission to hospital were asked whether they were a twin or triplet, and the twins so discovered were interviewed later. Unfortunately the time of admission to hospital of acutely ill patients is not conducive to accurate recall, and about half the twins admitted were not identified. A continuous double check was not possible. Such factors as short hospital stay, coma or stupor in the patient and early death combine to limit information about patients recorded as twins. Finally, language may be a barrier in a community with about 5% migrants of non-British origin.

After the index twin had been seen, an attempt was made to interview the co-twin. Ovularity was determined by using blood groups A, A₂, B and O, M-N-S, Rh grouping and subtypes, and C, P, Lewis, Duffy and Kell blood factors, ability to taste phenylthiocarbamide, secretor status and other data on physical features. Seven pairs have been accepted as identical in which no blood grouping was carried out (three pairs), and in which one comparison gave dissimilar findings (four pairs). No opportunity for retesting occurred in the last-mentioned four pairs, and they have been accepted as identical on the history of physical resemblance and confusion by those close to them.

¹ Work done with the aid of a grant from the Nuffield Foundation.

TABLE I.

Co-Twins.	Male Index Twins.				Female Index Twins.			
	Monozygous.	Disygous: Same.	Disygous: Opposite.	Zygosity Unknown. ¹	Monozygous.	Disygous: Same.	Disygous: Opposite.	Zygosity Unknown. ¹
Seen (116)	16	25	22	—	19	24	10	—
Died (133)	6	3	16	22 8	7	5	36	25 5
Not seen (50)	4	7	13	2	5	10	9	—
"Missed" (27)	—	—	6	6 6	—	—	2	4 3

¹ "Zygosity unknown" includes same sex pairs, zygosity unknown (first figure), and index twins, the sex of the co-twin being unknown (second figure).

From each twin, data on medical and family history were obtained, with a record of illness and physical examination. Unfortunately this was the concern of several physicians, and there is a lack of uniformity in the data. In most pairs the fasting serum lipide and cholesterol levels were measured. A social history was taken from the majority of pairs seen. Again the data obtained vary, although for a different reason. At one extreme are patients with a real personal problem who are only too willing to talk easily, others reveal very little, and some twins, patient or partner, have refused to cooperate at all.

By the means described, data have been accumulated on 326 index twins (including the index twin of triplets twice). Table I shows a breakdown into various groups. Only 116 pairs were seen, including 35 identical pairs—approximately 10 per year. Many co-twins had died earlier (133), 27 were "missed" (failure by investigator, non-cooperation, inadvisability of asking the co-twin to come to hospital). The co-twins of 50 index twins were not seen because they lived out of Melbourne—in other parts of Victoria (20), in another Australian State (14), or abroad (16). This scattering of families, partly accounted for by migration, is a major limiting factor in any satisfactory study of twins in Australia. An attempted postal survey, to find twins in an out-patient population, produced replies from only 55%; this further indicates the difficulties of follow-up investigation in this city.

Concordance was seen in 26 pairs. This included the following: seven identical male pairs (duodenal ulcer 1, cholelithiasis 2, polycystic kidney 1, fracture 1, glaucoma 1, carcinoma of the rectum and rectal polypus 1); four identical female pairs (depression and hypertension 1, appendectomy 2, removal of adenoids 1); eight non-identical male pairs (duodenal ulcer 1, appendicitis 3, fracture 4, injury to medial meniscus 1, asthma-emphysema 1—two pairs were listed twice); four non-identical female pairs (cholelithiasis 1, anxiety state and "nervous breakdown" 1, appendicitis 2); and three opposite-sexed pairs (syndactyly and tuberculosis 1, inguinal hernia 1, and emphysema with chronic bronchitis 1). Other instances of concordance were noted in which the co-twin had died earlier or lived out of Melbourne. The incidence of concordance in duodenal ulcer, cholelithiasis, appendicitis and fracture is shown in Table II.

Discordance in identical twins occurred many times, as follows: (1) male pairs: appendicitis (2), duodenal ulcer (1), cardiospasm (1), fracture (3), osteochondroma (1), cervical osteoarthritis (1), schizophrenia (2), psychoneurotic illness (2), depression (1), carcinoma of prostate (1), carcinoma of rectum (1), pericardial calcification (1), labyrinthine hemorrhage (1), submucous resection of nasal septum (1); (ii) female pairs: appendicitis (6), cholelithiasis (2), nervous diarrhoea (1), fracture (3), paraplegia (1), post-polio myelitis condition (1), carcinoma of thyroid (1), reticulosarcoma (1), menorrhagia (1), Bartholin's abscess (1), asthma (1), tuberculosis (1), congestive cardiac failure (1), migraine (1), swallowed foreign body (1), renal calculus (1).

For a large number of twin pairs numerical data are available for analysis. This was done for systolic and diastolic blood pressure and for fasting serum lipide and cholesterol levels (see Tables III, IV, V, VI). In no case was there a difference between identical and non-identical twins. The average systolic blood pressures of index twins and co-twins were the same, but the diastolic pressure of index twins was 6.5 millimetres of mercury higher than the average for co-twins. The spread of differences of systolic blood pressure for twins of the same sex is shown in Figure I. The serum cholesterol values were not different, but the serum lipide content of the index twins were on an average 42 milligrammes per 100 millilitres less than that of the co-twins. The simplest explanation of these findings is that illness is a stimulus whose overall effect is to raise the diastolic blood pressure and lower the fasting serum lipide content.

Twinning is said to occur in families. A family history of twins was present in about half the cases in which information was available. The mode of inheritance of twinning is not clear. Waterhouse (1953) considers that the tendency to dizygous twinning occurs through the female line. Oettle (1953) points out the paternal influence, which is inherited as a Mendelian dominant with incomplete penetrance. Other pedigrees may suggest recessive or dominant inheritance. McArthur (1951) suggests that the tendency to dizygous twinning as a maternal recessive gene is very common, and this renders analysis of pedigrees difficult. Two pedigrees showing both types of twins and in one an apparent paternal influence are presented in Figures II and III. Understanding of the genetics of twinning is

TABLE II.
Incidence of Concordances.

Pathological Condition.	Identical Twins.		Disygous Twins, Same Sex.		Disygous Twins, Opposite Sex.	
	Male.	Female.	Male.	Female.	Male Index.	Female Index.
Duodenal ulcer (10 pairs) .. .	1/2	—	1/3	—	0/5	—
Cholelithiasis (12 pairs) .. .	2/2	0/2	0/1	1/4	0/1 ¹	0/2
Appendicitis (38 pairs) .. .	1/3	1/3	3/3	2/9	0/7 ²	0/3 ²
Fracture (25 pairs) .. .	1/4	0/3	3/9	0/2	0/5 ²	0/2 ¹

¹ Condition in co-twin only.

² Condition in either index or co-twin.

TABLE III.
Differences in Systolic Blood Pressure in Twins.¹

Table IIIA.

Twin Group.	Mean Difference.	Number in Group.
Monozygous male ..	+2.98	15
Monozygous female ..	+11.47	15
Dizygous male ..	-2.48	25
Dizygous female ..	-2.05	21
Male female ..	+4.86	21
Female male ..	+8.12	8
Total ..	+2.27 ²	106

Table IIIB.

Analysis of Variance.	Sums of Squares.	Degrees of Freedom.	Variance.
Between groups ..	2377	5	475
Within groups ..	79,100	99	799
Total ..	81,486	104	Ratio 1.661 $p < 0.2$

¹ In this table, difference = systolic pressure of twin minus systolic pressure of co-twin, and similarly in subsequent tables. A conventional level of significance has been adopted. If p is less than 0.05, the differences seen would occur by chance less than once in 20 sets of observations.

² Significance of total mean difference:

$$t = 2.267 \div 2.74 = 0.827.$$

$$n = 104 \quad p \approx 0.4.$$

TABLE IV.
Differences in Diastolic Blood Pressure in Twins.¹

Table IVA.

Twin Group.	Mean Difference.	Number in Group.
Monozygous male ..	+8.73	15
Monozygous female ..	+8.02	15
Dizygous male ..	+7.17	24
Dizygous female ..	+5.86	21
Male female ..	+4.29	21
Female male ..	+7.0	8
Total ..	+6.48 ²	104

Table IVB.

Analysis of Variance.	Sums of Squares.	Degrees of Freedom.	Variance.
Between groups ..	232	5	46
Within groups ..	35,598	98	363
Total ..	35,830	103	Ratio 7.834 $0.05 > p > 0.01$

¹ The significant variation is in the "wrong" direction—that is, the mean is more nearly alike than expected.

² Significance of total mean difference:

$$t = 6.481 \div 1.647 = 3.941$$

$$n = 106 \quad p < 0.001.$$

TABLE V.
Differences in Serum Cholesterol Levels in Twins.

Table VA.

Twin Group.	Mean Difference.	Number in Group.
Monozygous male ..	-3.15	13
Monozygous female ..	+4.06	16
Dizygous male ..	-2.67	21
Dizygous female ..	18.42	19
Male female ..	12.69	16
Female male ..	-0.38	8
Total ..	1.20 ¹	93

Table VB.

Analysis of Variance.	Sums of Squares.	Degrees of Freedom.	Variance.
Between groups ..	9444	5	1889
Within groups ..	236,739	87	2721
Total ..	246,183	92	Ratio 1.441 $p > 0.2$

¹ Total mean difference is clearly not significant.

TABLE VI.
Differences in Serum Lipids Content in Twins.¹

Table VIA.

Twin Group.	Mean Difference.	Number in Group.
Monozygous male ..	-25.5	12
Monozygous female ..	-76.33	12
Dizygous male ..	-11.0	17
Dizygous female ..	-77.5	16
Male female ..	-45.0	12
Female male ..	-1.43	7
Total ..	-42.56	76

Table VIB.

Analysis of Variance.	Sums of Squares.	Degrees of Freedom.	Variance.
Between groups ..	65,837	5	13,167
Within groups ..	1,755,016	70	25,072
Total ..	1,820,703	75	Ratio 1.009 $p > 0.2$

¹ Serum lipid estimations were made by the turbidimetric method of Kunkel, Ahrens and Eisenmenger (1948).

² Significance of total mean difference:

$$t = 42.355 \div 14.813 = 2.862$$

$$n = 75 \quad p \approx 0.02.$$

rendered more difficult by the double influence of parity and maternal age (McArthur, 1952). In the crude data, this shows as increased frequency of twin births in later births of a sibship (see Table VII). The average age of the mother at the birth of the twins was 31.9 years (ranging from 18 to 45). For no apparent reason, the age of mothers of male index twins with identical or opposite sexed co-twins was significantly higher than that of the rest.

The numbers seen in this twin study are too small to provide information of value concerning the genetics of human disease. More productive results would accrue if all patients with one illness were studied, and to see 100 pairs requires approximately 10,000 patients (Simonds, 1956); but at the same time a large proportion would be unavailable for study because of death of the co-twin, and because of distance. Conceivably the personal or social factors which lead to the separation of siblings or their

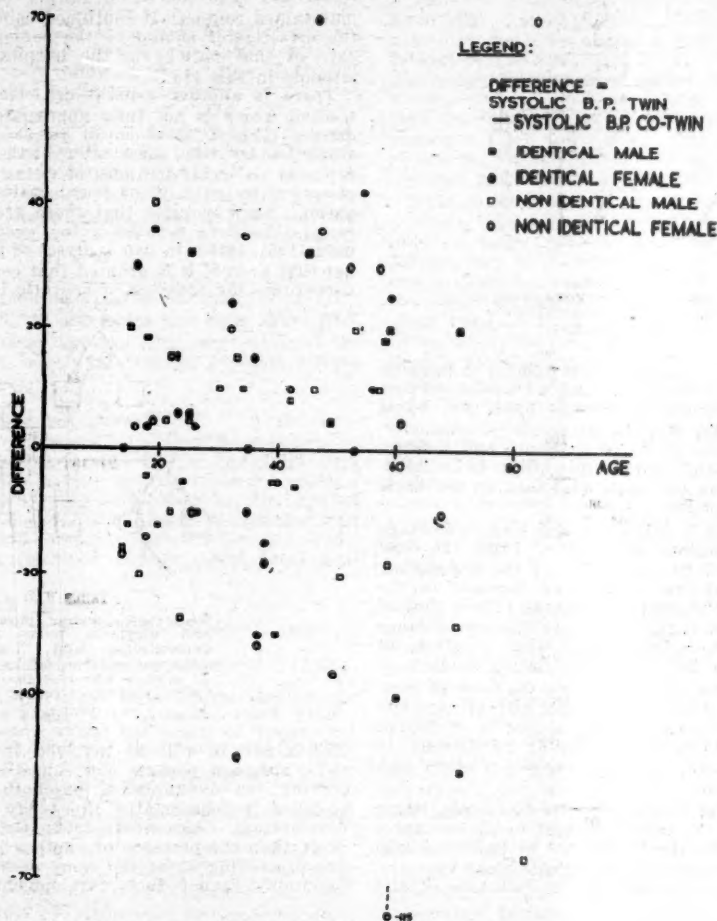


FIGURE 1.

Graph showing lack of correlation between difference in systolic blood pressures of twins and ovularity. Twins of opposite sex excluded.

Discussion.

The present sample has provided some interesting examples of concordance in twins, such as polycystic kidneys. It has also shown that environmental factors can lead to similar events in non-identical twins. Thus the twin brothers with medial meniscus injury were both footballers and thus above average in muscular activity, and the injury was related to football in one. An older brother, also a footballer, had had a meniscus removed after an injury during physical training in the Navy. Fracture represents a particular result of injury arising in many ways and involving bones whose mechanical strength varies greatly. The finding that concordance was frequent in fraternal twins suggests the importance of environmental or acquired factors. The figures for appendicitis are similar. The numbers with duodenal ulcer or cholelithiasis are so small that no firm conclusions can be drawn.

residence in the same locality may be of importance in the development of duodenal ulcer. Ideally, all living co-twins should be seen and reliable data sought concerning those co-twins who have died after attaining the age of risk for the condition under review.

The failure to do so in this study depends in part on the special properties of any population of general hospital patients, and in part on local conditions. By contrast, Simonds (1956) was able to ascertain zygosity and the presence or absence of tuberculosis in the co-twin of 97.3% of a population of over 20,000 tuberculous patients. A short stay in hospital, due to early death or discharge, or an illness in which coma or stupor is a major feature, are difficulties common to all general hospital patients. Peculiar to this country are the number of co-twins not seen because of distance and migration, and the small but definite language problem.

The diagnosis of ovularity is crucial to twin studies. Slater (1953) placed most weight on anthropometric features and finger prints. Yet from his table 95 co-twins and 26 twins were not examined, so that ovularity diagnosis of some of these pairs must be considered uncertain. Kallmann (1954) states that he has not used blood groups, and quotes Race and Sanger (1950) as stating that on this method alone the probability of wrongly accepting a pair

on serum cholesterol content. Nevertheless, it may be that a minority of persons may have abnormally high cholesterol levels, and that this abnormal equilibrium is dependent on genetic factors.

Kallmann (1954) mentions briefly the place of more detailed study of selected identical pairs. In the present study this was difficult to accomplish, since the patient was being adequately provided for by the hospital except in unusual circumstances. Essentially social problems sometimes gave the social worker better opportunity for maintained contact. If continued contact is essential, then the investigator should be the person responsible for the care of that patient in the hospital. Such was seldom possible in this study.

There is another general criticism of the twin study method which is not fully appreciated. Kallmann (1954) affirms that it is essential to assume that twins and singletons are the same after birth. Pitman (1957) has reported on social attitudes of twins one to the other and of society to twins, using female pairs seen in this investigation. She concludes that there are continuing dynamic factors operating between twins, even in adult life. Karpman (1951, 1953), in two analyses of fraternal twins, points out that even if it is granted that constitution or heredity determines the presence of neurotic illness, it is inevitable

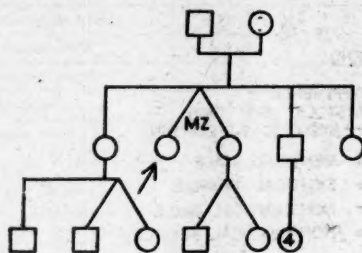


FIGURE II.

Pedigree showing monozygous and dizygous pairs in two generations. Father has twin cousins.

as identical is about 4%. However, it is difficult to imagine any method being better than this, and we would support those critics of Kallmann's paper who hold that blood grouping is an essential step in diagnosis of ovularity. Recently tables have been prepared by Smith and Penrose (1954) whereby the probability of miscalling twins identical can be estimated in the individual case on the basis of blood group frequencies.

The incidence of twins in this study was 1.1%, allowance being made for readmissions to hospital. From the data of Karn (1951), twins form about 2% of the population. This loss of about half the twins is an increase in the lack of randomness of the sample. Simonds (1956) showed that such a selection of twins might produce concordance rates differing from those found in another selection, in which twins are nearly 2% of the population studied.

For these reasons—the small numbers, the lack of complete identification of twins, and the difficulty of complete coverage of co-twins—the twin study method is of limited value when applied to general hospital admissions in Melbourne. Results would be more concrete if effort was focused on one condition.

The lack of any pointer to any inherited factor regulating blood pressure, serum cholesterol content or serum lipide content seems to indicate the importance of environmental factors. While this is surprising as regards blood pressure, recent studies place great weight on the influence of diet

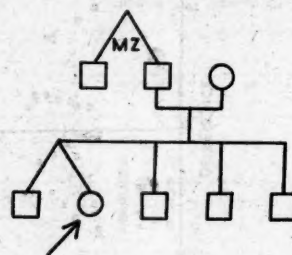


FIGURE III.

Pedigree showing monozygous and dizygous pairs in two generations, and illustrating apparent paternal effect. Cousin of mother has had two sets of twins; cousin of father has had twins.

that a co-twin will be involved in the neurosis of any twin, although perhaps not causally. Many theories concerning the dynamics of psychotic, psychoneurotic and so-called "psychosomatic" illness lay stress on the infantile development (Alexander, 1952; Grinker, 1953). If this is so, then the presence of another individual of the same age proceeding along the same path of development must inevitably render such development different from that

TABLE VII.
Birth Order of Twin Pairs.¹

Number of Births in Sibships.	Dizygous Twin Pairs.													Number of Births in Sibships.
	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	5	—	—	—	—	—	—	—	—	1	—	—	—	13
2	1	2	—	—	—	—	—	—	—	—	—	—	—	12
3	—	1	1	—	—	—	—	—	—	—	—	—	—	11
4	1	2	2	—	—	—	—	—	—	—	—	—	—	10
5	—	—	—	1	3	—	—	1	1	—	—	—	—	9
6	1	—	—	1	—	4	—	1	—	1	—	—	—	8
7	1	—	—	—	2	—	1	—	—	—	—	—	—	7
8	—	—	—	—	1	—	—	—	—	1	—	—	—	6
9	—	—	—	—	—	—	—	—	—	—	—	—	—	5
10	—	—	—	—	—	—	—	—	—	—	—	—	—	4
11	—	—	—	—	1	—	—	1	—	—	—	—	—	3
12	—	—	—	—	—	—	—	—	—	—	—	—	—	2
13	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Monozygous Twin Pairs.														
1	—	—	—	—	—	—	—	—	—	—	—	—	—	13
2	—	—	—	—	—	—	—	—	—	—	—	—	—	12
3	—	—	—	—	—	—	—	—	—	—	—	—	—	11
4	—	—	—	—	—	—	—	—	—	—	—	—	—	10
5	—	—	—	—	—	—	—	—	—	—	—	—	—	9
6	—	—	—	—	—	—	—	—	—	—	—	—	—	8
7	—	—	—	—	—	—	—	—	—	—	—	—	—	7
8	—	—	—	—	—	—	—	—	—	—	—	—	—	6
9	—	—	—	—	—	—	—	—	—	—	—	—	—	5
10	—	—	—	—	—	—	—	—	—	—	—	—	—	4
11	—	—	—	—	—	—	—	—	—	—	—	—	—	3
12	—	—	—	—	—	—	—	—	—	—	—	—	—	2
13	—	—	—	—	—	—	—	—	—	—	—	—	—	1

¹The figures are to be read left to right. Thus there were one monozygous pair fifth in a sibship of nine, and three dizygous pairs seventh in a sibship of eight.

of a singleton. Only twins reared apart, and in circumstances in which maternal deprivation is not a factor, could be considered as avoiding this difficulty. Karpman points out that fraternal twins are useful in the study of a similar environment on individuals genetically different, a converse to the usual biological approach.

Summary

1. The methods used in a twin study of general hospital admissions have been described.
2. The results of this study show that the ascertainment of twins is incomplete, and that various factors combine to interfere with complete follow-up of all twins discovered. Local difficulties include migration, scattering of families, and even language.
3. The concordant pairs have been listed, and the incidence of concordance in duodenal ulcer, cholelithiasis, appendicitis and fracture has been noted.
4. The results with appendicitis and fracture suggest the general lack of genetic factors in these illnesses. The numbers are insufficient to permit simple conclusions in other conditions.
5. The assumptions of twin studies have been reviewed, and the tacit and essential assumption that twins after birth develop similarly to singletons has been challenged.
6. In the light of these findings, the possibilities of the twin study method in a general hospital population have been discussed.

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ILLNESS IN TWINS: II. DUODENAL ULCER.¹

By R. K. DOIG,

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THERE is frequently stated to be a genetic factor in the occurrence of duodenal ulcer. Doll and Buch (1950) showed a greater incidence of peptic ulcer in brothers, sisters and fathers of patients with peptic ulcer, in comparison with the normal incidence estimated from the survey of Doll, Avery Jones and Buckatzsch (1951). Further, it was shown that the tendency in siblings was to have ulcers in the same site (Doll and Kellock, 1951). Wretmark (1953) has shown a similar greater incidence of peptic ulcer in brothers and fathers of patients.

Twin studies have frequently been misused to suggest a genetic factor in illness, on the basis of concordance in identical pairs. The danger of this method was initially pointed out by Luxenburger (1930). Single reports on peptic ulcer in identical twins still occur (McHardy and Browne, 1944; Riecher, 1946; Ivy and Flood, 1950). On the other hand, Kidd (1938) reported fraternal, single male twins, aged forty-one years, whose duodenal ulcers perforated within three days of each other.

The following case reports concern 10 twin pairs amongst 116 pairs seen and examined, in which one or both twins had a duodenal ulcer. The general problems of ascertainment and the proportion of twins living away from the index twins have been discussed in the first paper of this series (Doig and Pitman, 1957). The purpose of this paper is not to present evidence relative to the strength of the genetic factor, but to record the concordances seen so that the data may be incorporated in any similar study.

Reports of Cases.

CASE I.—A male patient, aged forty-nine years, had suffered from indigestion for four and a half years. X-ray evidence of duodenal ulcer had been obtained twice, and he had had two small hæmatemeses. He had pain in the back before operation. A partial gastrectomy was performed in May, 1953. Since then he was lighter in weight than before, but otherwise had no symptoms to review in December, 1956.

His male co-twin had experienced the onset of peptic ulcer in 1931, during the financial depression. A gastroenterostomy had been established in 1938. He had severe hæmorrhages in 1949 and 1950, which were followed by partial gastrectomy. Since then he had eaten freely, his weight had remained constant and he had had only occasional cramp-like pain in the region of the scar, up to December, 1956.

These twins have identical blood groups and physical appearance. They are very close, and recognize similar personality features in themselves, which they relate to their ulcer symptoms. The co-twin fared worse in the financial depression, and at the same time nursed his mother-in-law over a period of three months. His symptoms started after her death. Both twins are meticulous, worrying and perfectionistic in nature. They bottle up their feelings and will discuss problems only with each other.

CASE II.—A male patient, aged sixty-one years, was admitted to hospital in 1955 with symptoms of carcinoma of the rectum, present for a few months. Resection was performed, although hepatic metastases were known to be present. The patient died about twelve months later. He had suffered a fracture of the wrist in 1949, and in 1953 was admitted to hospital in a confused state. These symptoms were thought to be due to cerebral arterial disease. There was no history of indigestion.

His male co-twin was known to have attended for treatment of indigestion in 1938. In 1943 he was admitted to hospital with melæna, and a further history of regurgitation of food was obtained. A diagnosis of cardiospasm was made. On review in 1955, the patient still had indigestion relieved by food, difficulty with swallowing, and chronic cough and

¹Work done with the aid of a grant from the Nuffield Foundation.

sputum. He had emphysema, and a barium meal X-ray examination revealed cardiospasm and scarring of the duodenal cap. A sigmoidoscopic examination was performed and a small polypus was seen in the rectum. On examination of sections it proved to be an adenoma.

The blood groups of these twins were identical. Both were able to taste phenylthiocarbamide, and a secretor substance was present in the saliva of both. They bore a strong physical resemblance to each other. Both twins were apprehensive and easily upset by illness. They were close in their development and kept contact in adult life.

CASE III.—A male patient, aged forty-nine years, had first had symptoms at the age of twenty-one years, and had had episodic indigestion thereafter. He had had a hematemesis at the age of thirty-four years, and had undergone a partial gastrectomy at the age of forty-four years. He suffered from biliary regurgitation after operation and was miserable till an entero-anastomosis was performed twelve months before his admission to hospital. This led to some relief of symptoms. On radiological examination the stomach was found to be small and "tucked up", with free reflux from the afferent loop. The patient was apprehensive and resentful and there was an element of habit in his regurgitation.

His male co-twin was examined at the age of forty-six years. He had a history of epigastric pain relieved by food since the age of fifteen years, present periodically. He had had a melena at the age of thirty years. The patient stated that a duodenal ulcer had been diagnosed radiologically, but the report could not be traced.

The physical appearance and blood groups of these twins were different.

CASE IV.—The patient was a man, aged 21 years. He was admitted to hospital with a melena, and had a history of recurrent indigestion of five years' duration. An X-ray examination three months earlier had revealed a duodenal ulcer. The patient worried excessively about his work, and had difficulty in relation to his superiors.

His male co-twin had no history of indigestion. He stated that he was more happy-go-lucky than the index twin, who was the leader. His appearance did not reflect his expressed care-free nature.

There was considerable rivalry between these twins in childhood. The co-twin had done better at school. Their physical appearance and blood groups are different.

CASE V.—The patient, a man, aged thirty-three years, was admitted to hospital for the investigation of *petit mal* epilepsy, present for about a year. He gave a history of ulcer of fifteen years' duration. He was a worrying, hard-working labourer, with few interests outside work. He was happily married.

His male co-twin was a healthy shop assistant who had occasional hay fever. He was a "good time boy" and extravagant. He was unmarried, but had been engaged for many years.

The physical appearance and blood groups of these twins are different.

CASE VI.—A male patient, aged thirty-two years, had a history of nervous breakdown at the age of twelve years. He had had indigestion six months prior to examination. It had recurred over the past ten days and he was admitted to hospital with hematemesis and melena. The diagnosis of duodenal ulcer is presumptive.

His female co-twin has no indigestion and is well.

CASE VII.—A male patient, aged forty-two years, was admitted to hospital with hematemesis and melena. He had a past history of indigestion six years earlier, lasting for six months. Scarring of the duodenal cap and possible gastric ulcer were found on radiological examination.

His female co-twin had a past history of having been in a motor-car accident and of having had a nervous breakdown three years earlier, with four bouts of diarrhoea recently. She had no indigestion.

CASE VIII.—A male patient, aged fifty-two years, had been admitted to hospital with fever and swollen right inguinal glands. The cause was eventually shown to be reticulum cell sarcoma, and the patient died five months later. The duodenum was normal at the post-mortem examination. The patient had a history of indigestion in 1935 (age thirty-three years) and in 1944. A clinical diagnosis of ulcer only had

been made. The patient had had no symptoms for about ten years.

His female co-twin had had recurrent attacks of pain and jaundice from the age of seventeen years till her gall-bladder was removed at the age of fifty-two years. She had no other indigestion.

CASE IX.—A male patient, aged sixty-five years, had a long history of minor indigestion from the age of fifteen years. He had been a heavy smoker all his life. He was admitted to hospital with acute perforation of a duodenal ulcer. He said that he felt "peaceful" in hospital and stopped smoking. Four months after operation he had no indigestion and was smoking less.

His female co-twin had no indigestion. She had a past history of recurrent respiratory tract infections since the age of thirty-two years, and of hypertension since the age of fifty-nine years, with symptoms of cardiac failure. There was a clear relation of symptoms to changes in relationship with her daughter.

CASE X.—A male patient, aged fifty-eight years, had had a coronary occlusion three years earlier. He had had water-brash and heartburn for two or three months before acute perforation of a gastric ulcer near the pylorus. There was a past history of tuberculosis.

His female co-twin is tense and unhappy. Her husband is on a full repatriation pension for an anxiety state. There is no history of indigestion.

This case has been included since it is thought that a surgical diagnosis of the site of an ulcer is often fallacious and that such pyloric ulcers have a natural history more closely resembling that of duodenal ulcer.

During the period of this study there were also examined six men and four women who were twins and who had duodenal ulcers. The co-twins of these index twins were not seen; five had died at birth or in infancy, and three had died later (at 12 years from meningitis, at 32 years during the war, and at 42 years with carcinoma of the bowel). One patient refused to permit contact with his brother, and it was not possible even to assess whether they were identical. The brother of one female patient was not seen because he worked as a shearer and was seldom in Melbourne. The incidence of ulcer in the two groups is roughly comparable. There were 11 cases in 197 in the pairs seen and 10 in 210 in the remainder, identical twins being counted once only. There were four cases of gastric ulcer in the whole series of index twins.

Discussion.

From the 10 cases in which both twins were seen, it is clear that sharp proof of "hereditary constitution" is lacking and is unlikely. On one hand it is still possible that the co-twin in Case IV may develop an ulcer, while in Case II the co-twin had passed the age of maximum risk without symptoms. Even on the brief information available it is also evident that psychological factors are of moment in the development of symptoms in many of the patients. In the concordant identical pair this was explicitly recognized by both patients. Further, what were accidental factors in their job security at the onset of the financial depression played a part in the freedom of the index twin, and in setting the ground for symptoms in the co-twin.

The closeness of identical twins is well illustrated in the two pairs described in this paper. On the other hand, the excess of rivalry between the twins in Cases IV and V is illustrative of the difference in development of twins compared with singletons. The factors of sibling affection and rivalry are accentuated; and this is contributed to by the social attitude which apparently refuses to acknowledge the existence of dizygous twins of the same sex (Pitman, 1957).

Thus, even if it was shown that concordance was higher in identical twins, this could relate to similar environment in the first few years of life, when the basic major part of self-recognition and personality development occurs; for it is to this period that the underlying conflicts of the patient with duodenal ulcer are referred (Alexander, 1953; Grinker, 1953). On the other hand, it may be due to the similarity in personality being inherited and providing

a similar framework within which the conflicts or feelings associated with duodenal ulcer may develop.

In their study of twins in Denmark, Harvald and Hauge (1956) have found 123 twins with peptic ulcer amongst those of 1900 pairs who have survived at least to the age of 30 years. Of 23 identical pairs, six showed concordance, and of 41 fraternal pairs of the same sex five showed concordance. This difference is not greater than one would expect to occur by chance ($P > 0.1$), although it is in the same direction as that found in other diseases—for example, asthma, diabetes and cholelithiasis. These authors refuse to accept this as evidence of a genetic factor, pointing out the likely importance of environmental factors within the family. Doll and Kelloff (1951) have considered and excluded the effects of age, sex and social class in their data, and accept their results as indicative of a genetic factor without any consideration of the less easily categorized factors representing interplay between personality and environment.

At the present time there is no way out of this dilemma. There is little doubt in the minds of many that psychological factors are important in the understanding of why a person has a duodenal ulcer; but the delineation of the necessary and sufficient features of these factors is not possible at present. Since their origins may be in the earliest period of development, methods such as twin or family studies are unlikely to separate genetic and acquired factors in the aetiology of duodenal ulcer.

Summary.

1. Of 116 pairs of twins, one of whom has been a patient in hospital, in 10 pairs one or both members had a duodenal ulcer.
2. Of two identical pairs, concordance occurred in one. The discordant pair were aged 61 years when seen, so that future development of an ulcer was unlikely.
3. Of three fraternal pairs of the same sex, concordance occurred in one. The two non-affected twins were young adults.
4. Five males with duodenal ulcer had twin sisters free from ulcer-type indigestion.
5. The difficulties inherent in genetic studies of an illness like duodenal ulcer have been discussed.

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STONE IN THE LOWER PART OF THE URETER.

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THE main differences of opinion in the treatment of ureteric calculi occur in cases in which the stone is situated below the pelvic brim. The indications for active interference in cases of ureteric stone, enumerated by Dix (1953) on the basis of a large series of his own, are now generally accepted. When removal of a stone situated above the pelvic brim is indicated, open operation is considered the only safe method. However, when the stone is situated below the brim of the pelvis, two main lines of treatment are available—ureterolithotomy, or endoscopic removal. Many endoscopic methods have been described, but most suffer from the disabilities of complexity, uncertainty of result and some not inconsiderable technical dangers. On the other hand, ureterolithotomy on the pelvic section of the ureter is associated with a higher morbidity rate (urinary fistula particularly), and is technically a more difficult operation than its counterpart on the upper part of the ureter.

Dix confines the use of endoscopic methods mainly to intramural calculi. Kittredge and James (1954), on the other hand, using endoscopic methods when possible, found open operation necessary in 94% of stones in the upper part of the ureter, but in only 21% of stones in the lower part of the ureter. Supporting these findings, Middleton and Grua (1952), using a Johnson (1937) snare, extracted stones at the first attempt in 43 of 70 cases. In all, 59 patients with stones in the lower part of the ureter were successfully treated endoscopically; nine did not return for follow-up examination, and in only two cases was open surgery subsequently required.

ENDOSCOPIC METHODS AVAILABLE.

Many endoscopic methods have been described, and all fall into one of the following three main groups:

1. The passing of a ureteric catheter beyond the stone, with either the injection of a sterile lubricant or the leaving of the catheter *in situ*. Whilst such methods involve little risk to the integrity of the ureter, passage of the stone occurs in relatively few cases.
2. Ureteric meatotomy. Again this is a relatively safe procedure, and has proved, in this series, to be effective in the treatment of stones situated close to the ureteric orifice. A combination of coagulation followed by cutting diathermy is recommended as a method of ureteric meatotomy. This avoids the delay which occurs with coagulation alone, and also the troublesome bleeding which may occur with the cutting diathermy method.
3. The use of traction instruments. These are undoubtedly effective in removing stones from the pelvic portion of the ureter. It is in their use that most controversy arises, as the risks of ureteric perforation or avulsion and instrumental impaction are not inconsiderable. Ellik (1951), in reporting a series of 104 cases of ureteric stone, found that it had been necessary to perform ureterolithotomy with the loop of the extractor engaged on the stone in six cases, and that rupture of the ureter occurred in a further four.

Whilst any method by which traction is put on a stone in the ureter is attended by risks of ureteric damage, the more rigid instruments are the more dangerous. These catastrophes are also in part dependent on the state of the ureter; a ureter which is oedematous and friable from gross infection, or one in which the stone has been stationary for a long period, is far more likely to be damaged than a ureter in which a stone has only recently impacted.

Davis (1954) describes a simple and relatively safe instrument. It is less rigid than the Council snare (1936) or the Johnson (1937) snare; the loop can be formed in the ureter itself, not in the renal pelvis, as was necessary with the Ellik (1951) loop; and should the stone become

impacted with the loop engaged, the loop can be relaxed and the instrument removed.

The loop catheter can be made quite simply from a boilable plastic ureteric catheter (Ch. 6), which is threaded with size 3 or 4 nylon suture, brought out through a needle hole in the wall of the catheter 10 centimetres from its tip, through both walls of the catheter at 5 centimetres, back into the lumen of the catheter at 10 centimetres, and so down the catheter so that both ends of the nylon project beyond the end of the catheter (Figure 1, a). As the nylon suture is supplied in standard lengths, it is necessary to reduce the length of the catheter in order that both ends of the nylon may protrude beyond the end of the catheter. The loop catheter is passed up the ureter after a ureteric meatotomy has been performed. When the catheter is beyond the stone, a loop is formed by increasing the tension on the nylon (withdraw approximately three-quarters of an inch), and traction on the catheter will then engage the loop on the stone.

MATERIAL.

Interest in this problem was stimulated whilst I was working with Mr. E. W. Riches, who kindly permitted a review of the last 100 patients with proven ureteric calculus under his care at the Middlesex Hospital, St. Andrew's Hospital, and the Royal Masonic Hospital, London. In view of the importance of the site of the stone in deciding treatment, these cases are discussed in two broad groups: stones in the pelvic portion of the ureter, 79 cases; stones in the upper part of the ureter (above the pelvic brim), 21 cases.

RESULTS.

Upper Part of the Ureter.

In four of this group of 21 cases the stone passed spontaneously. Of the remainder, ureterolithotomy was performed in 13 and nephrectomy in four. The complications were negligible; the mortality was nil, and temporary urinary fistulae occurred in two cases, lasting only eight and fourteen days respectively.

As the prime object of this paper is a review of the problem of management of stones in the lower part of the ureter, this group will not be discussed further.

Pelvic Part of the Ureter.

Seventy-nine cases fell into this group. Spontaneous cure occurred in 19, a figure closely allied to that obtained in the treatment of stones in the upper part of the ureter (4 out of 21). However, with the use of endoscopic manipulations in a little over half the cases, open surgery was necessary in only 21 cases. The failure of endoscopic manipulations was the indication in seven of these; in two there was a ureteric papilloma as well as the calculus; in the remaining twelve, gross hydronephrosis, absence of function, large or irregular stone and severe infection were the reasons for open surgery. Nephro-ureterectomy was performed in four cases, and ureterolithotomy in the remainder. These results may be tabulated as follows:

Total number of cases of stone in the lower part of the ureter	79
Spontaneous cure	19
Open operation	21
Endoscopic manipulation (success, 37; failure, 7; no follow-up, 2)	46

In view of the apparent value of endoscopic manipulations in the treatment of stones in the lower part of the ureter (37 out of 79 successful in this series), the individual methods employed have been analysed more fully and their relative values assessed.

Analysis of Endoscopic Methods.

Injection of Sterile Oil Above the Stone.—This method was used in only three cases and there were no successes. However, it is important to note that all three patients were successfully treated at a later date by other endoscopic methods (two by an indwelling ureteric catheter and the other by ureteric meatotomy).

Indwelling Ureteric Catheter.—This method was employed in twelve cases, the catheter being left *in situ* for from 24 to 48 hours. There were seven successes and five failures; the stone was passed in two of these unsuccessful cases when the procedure was repeated in association with ureteric meatotomy (Table I). When the use of an indwelling ureteric catheter is coupled with ureteric meatotomy, the success rate of the procedure increases. Also, in all cases in which it was passed, the stone was within four centimetres of the ureteric orifice. It seems likely, therefore, that the improvement in Group II is due mainly to the meatotomy.

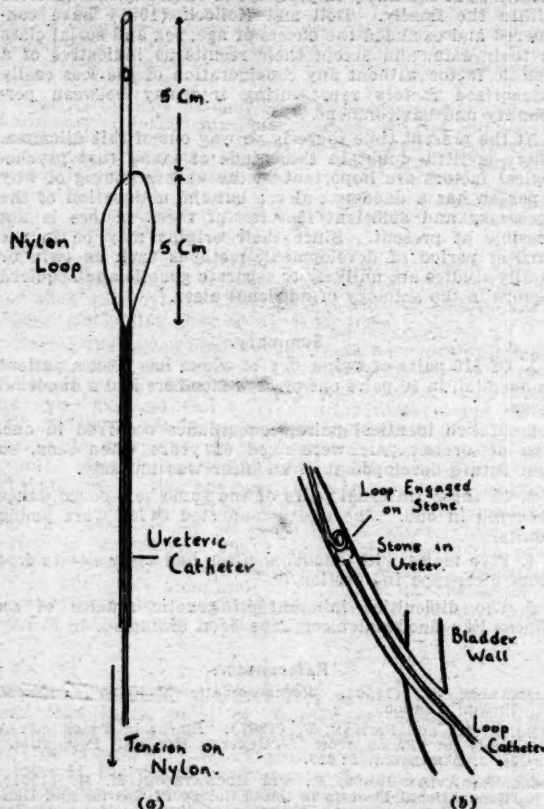


FIGURE 1.

(a) Showing the loop catheter with the nylon suture lying loosely in position; the dimensions of the loop are indicated. (b) Diagram representing a loop catheter engaged on a stone in the lower part of the ureter.

Ureteric Meatotomy.—Thirty patients were treated by ureteric meatotomy alone. There were nineteen successes and nine failures, and in two cases the patient did not return for follow-up examination. The highest success rate was obtained in cases in which the stones were either intramural or within two centimetres of the ureteric orifice (Table II). The time interval between meatotomy and the passage of the stone also appears to be related to the distance of the stone from the ureteric orifice; when it was within two centimetres, the time varied from one to twenty-one days (average four days); when it was beyond two centimetres the period varied from two weeks to four months. Of the failures from this method, in six ureterolithotomy was required, and in three subsequent treatment by a loop catheter technique was successful.

The Ureteric Corkscrew.—The use of the ureteric corkscrew as a method of applying traction to a stone was tried in only three cases and was unsuccessful in all three.

The Davis Loop Catheter.—The Davis loop catheter has been used in the last nine suitable cases. In all, the

catheter was passed beyond the stone, the loop was formed and engaged on the stone, and the stone was drawn down towards the bladder. (In two cases two attempts were necessary). In two cases the stone broke; in one of these, all the fragments were removed; in the other, the larger fragment was left *in situ*. It had not been passed six weeks later, and this is the only failure to date. There were no cases of ureteric damage or instrumental impaction. These results may be tabulated as follows:

Total number of cases	9
Stone extracted	5
Stone drawn down and subsequently passed	2
Stone broke and fragments removed	1
Stone broke and fragments left <i>in situ</i>	1

TABLE I.

Stone in the Lower Part of the Ureter (12 Cases): Treatment with an Indwelling Ureteric Catheter, With and Without Ureteric Meatotomy.

Group.	Number of Cases.	Success.	Failure.
Group I: No meatotomy	6	3	3
Group II: With meatotomy	3 ¹	3 ¹	2

¹ These figures include two of the failures from group I.

It is recommended that a ureteric meatotomy be performed as the first step. If this is not done, as in one of our cases, the stone may become impacted at the bladder wall. After releasing the loop and performing a meatotomy, it may prove impossible to re-pass the loop catheter. After a meatotomy has been performed, care must be taken of the upper corner of the diathermy cut, as this is the most likely site of perforation.

TABLE II.

Results of Ureteric Meatotomy at Various Levels in the Lower Part of the Ureter (30 Cases).

Site of Stone.	Number of Cases.	Success.	Failure.	No Follow-up Examination.
At the ureteric orifice	6	4	1	1
1 to 2 centimetres from the ureteric orifice	15	12	2	1
3 to 4 centimetres from the ureteric orifice	6	2	4	—
More than 4 centimetres above the ureteric orifice	3	1	2	—
Total	30	19	9	2

DISCUSSION.

Analysis of the results obtained in this rather small group indicates that the Davis loop has proved remarkably effective. These results reflect those reported in the original article of Davis (1954), in which he reported 14 consecutive successful cases. It is thought that the Davis loop is simpler, safer and just as effective as the more rigid traction instruments.

Ureteric meatotomy alone has proved of use not only for the intramural types, but also in cases in which the stone is situated outside the bladder wall. The critical site appears to be approximately two centimetres from the ureteric orifice. Proximal to this level, both the time taken for the stone to pass and the incidence of failures increase. On the other hand, the Davis loop is more effective in cases in which the stone is situated between this level and the pelvic brim. Accordingly, I intend to use these two methods in all future suitable cases of stone in the lower part of the ureter.

Exactly what constitutes a suitable case is difficult to define. The size of the stone has not proved a completely reliable guide. Kittredge and James (1954) put the critical size of a stone for endoscopic manipulations at a diameter

of three-quarters of an inch; but this would appear to be an over-simplification, as in this series the largest stone removed endoscopically measured five-eighths by three-eighths of an inch, yet the smallest which required open surgical removal was one-eighth of an inch in diameter. The decision must obviously be made on each individual case, such factors being taken into account as the site, shape and size of the stone, the duration of impaction, the presence or absence of gross infection, and the previous passage of a stone down that ureter.

These procedures should be performed only in a hospital operating theatre, never on an out-patient, for, whilst the incidence of technical complications by the two methods advocated is less than with more rigid instruments, the possibility of their occurrence still exists, and one must naturally be prepared to deal immediately with any catastrophe.

A search of the literature has not revealed any long-term complications of ureteric meatotomy, such as stricture or reflux, nor have any been found in this series.

A final point requires mention. Even the stone destined to pass spontaneously requires investigation, often including retrograde ureteric catheterization and pyelography. The endoscopic removal of such a stone at the time of catheterization is gratifying for the patient and relieves him of the discomfort of further attacks of renal colic.

ACKNOWLEDGEMENT.

I wish to express my gratitude to Mr. E. W. Riches for allowing me to use his cases in this review, and for his help and guidance in its preparation.

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Reports of Cases.

OBLITERATIVE ARTERIAL DISEASE IN A YOUNG GIRL.

By LESLIE P. WAIT, M.D.,
 Royal Children's Hospital, Melbourne.

In the published report of a medical meeting held in the year 1908, Takayasu described certain unusual appearances of the blood vessels of the ocular fundi of a patient. At the same meeting, Onishi and Kagoshima reported having seen two patients with similar changes, but added the observation that in one patient the radial pulses could not be palpated. In subsequent Japanese medical literature 58 similar cases have been described. In the Japanese series the disease affected young women exclusively. Descriptions of similar cases occurring outside Japan have appeared in later medical literature.

A patient under my care at the Royal Children's Hospital, Melbourne, presents at least one clinical feature which is in keeping with that mentioned by Onishi and Kagoshima, that is, absence of both radial pulses. This developed during her stay in hospital when she was being treated for an equally puzzling condition which was designated "col-

lagen disease". The history, main clinical features, investigations and clinical course of the disease in this patient up to the present time are of sufficient rarity to warrant their recording.

Clinical Record.

A, a girl, aged seven years and eleven months, is the last child of a family of five children born in Ireland of Irish parents. She was admitted to hospital on March 19, 1955. For two months prior to her admission she had appeared pale with a drawn facies, and her appetite was poor. She walked with difficulty. Her shoulders were hunched and her legs appeared to be so cramped that she took short steps and walked on her toes. Just prior to her admission she complained of pain behind both knees and over both shins. There were no other symptoms of importance. Neither the family history nor the patient's previous history disclosed any helpful information.

Examination revealed her to be a pale child of asthenic build. No abnormality was detected in the heart or lungs. The systolic blood pressure was 114 millimetres of mercury and the diastolic pressure, 90 millimetres. There was limitation of extension of the right leg at the knee, which appeared to be due to tightness of the flexor muscles of the thigh.

One of the striking features was the presence of unusual subcutaneous nodules. Two of the largest of these were situated in the anterior abdominal wall, one occupying an area of approximately four square inches. They were hard to the touch with an irregular edge. Other smaller nodules were situated in the adductor canal regions of both thighs and on the flexor aspects of both forearms. There was no attachment to the skin, but they appeared to be fixed to the underlying tissues. Those on the forearms seemed to lie in the course of the superficial veins. Slight tenderness was noticeable in the forearm nodules only.

The Mantoux, Wassermann, Kahn and Paul-Bunnell tests yielded no information of a positive character. The urine contained no albumin, and no sugar; the microscopic findings were normal. Attempted culture of a throat swab yielded no pathogens. A blood count gave the following information: the hemoglobin value was 56% (8.1 grammes per centum); the leucocytes numbered 13,250 per cubic millimetre, 67% being neutrophils, 32% lymphocytes and 1% eosinophils; the platelets were normal; the erythrocytes showed mild anisocytosis. The erythrocyte sedimentation rate was 57 millimetres in one hour. The hematocrit reading was 32. The serum protein content was as follows: the total protein content was 6.8 milligrammes per 100 millilitres, albumin 2.5, globulin 4.3 milligrammes per 100 millilitres; of the globulin, the distribution in milligrammes per 100 millilitres was as follows: α_1 globulin 0.77, α_2 globulin 1.16, β globulin 1.20, γ globulin 1.30. The blood urea content was 26 milligrammes per 100 millilitres and the serum cholesterol content was 213 milligrammes per 100 millilitres. *Lupus erythematosus* cells were not seen. The serum contained no agglutinins to brucella organisms. Radiographic examination of the chest, abdomen and extremities failed to disclose any abnormality. The electrocardiogram was normal.

One of the subcutaneous nodules in the abdominal wall was excised for microscopic examination. Dr. Alan Williams, pathologist, furnished the following report on this specimen:

A chronic non-specific inflammatory reaction is present. There is a leucocytic infiltration, consisting of lymphocytes, histiocytes, and a moderate number of multinucleated giant cells. There are a few foci of more acute inflammation in which polymorphs are also present. The inflammatory cells are widely distributed in the connective tissue and there appears to be a change in the collagen and elastic fibres. There is no evidence of polyarteritis nodosa.

A biopsy section of one of the superficial veins of the forearm was taken before the arteriographic examination was performed. Microscopic examination showed that the wall of this vein was considerably thickened as a result of excess of collagenous tissue. There was patchy leucocytic infiltration. The outer layers of the vein were the most conspicuously involved.

For an approximate period of three weeks, during which these investigations were being conducted, the patient had a persistent, moderate rise in temperature. On the available evidence it was considered that she was suffering from some obscure collagen disease, but there was still some doubt. She was given a blood transfusion. It was then decided to try the effect of cortisone. Caution at the outset was exercised, the initial dose being 25 milligrammes of cortisone administered twice daily. The response was dramatic. Over a period of a week the temperature became normal, all muscular rigidity disappeared and the subcutaneous nodules decreased in size. After a period of several weeks the dosage of cortisone was reduced. There was an obvious relapse, as evidenced by a rise in temperature and an increase in the size of the nodules. On reversion to the original dose of cortisone, a rapid remission was again apparent. However, the erythrocyte sedimentation rate was 48 millimetres in one hour. During the course of the cortisone therapy, "moon face" and hirsuties on the extremities occurred. The blood pressure, recorded at regular intervals, was normal.

After two months' treatment, as the girl was reasonably well, she was transferred to the Orthopaedic Section of the Royal Children's Hospital at Frankston. Shortly after this it was noted that neither of the radial pulses could be palpated, although the femoral pulses were found to be strong. Eleven days later it was found impossible to record the blood pressure in the upper extremities owing to the absence of palpable radial pulses, and also to the absence of Korotkoff's sounds in the cubital fossae. Coincidentally with this there occurred a rise in her temperature. A few days later she suffered a convulsive seizure with clonic movement of the left side of her body, followed by left-sided hemiparesis, bilateral vertical and horizontal nystagmus and a deviation of the tongue to the right. The hemiplegia cleared rapidly and there has been no evidence of it since. The deviation of the tongue has persisted. At this stage it was noted that neither of the femoral pulses could be palpated. Carotid pulsations were strong. She was readmitted to the Royal Children's Hospital. It was now apparent that a complication of the "collagen disease" had declared itself in the form of occlusive arterial disease apparently involving the larger arteries.

To complete the clinical account, mention must be made of one episode during this girl's illness. She had an attack of abdominal pain followed by a mild melena. This may have been due to some vascular complication in the bowel, but it is realized that it could have been due to some other cause.

Dr. A. J. Barnett, Associate Director of the Clinical Research Unit, Alfred Hospital, Melbourne, who is an authority on arterial disease, was invited by me to examine this patient in consultation. His examination confirmed our fears that there had been an occlusion involving the main arterial trunks of the upper extremities and also those of the lower limbs. Elevation of the extremities resulted in pallor of these parts, and on dependency there was a slow return of colour. This is evidence of impairment of the peripheral vascular circulation. There was no evidence of gangrene, nor were there any symptoms referable to the limbs as a result of this apparent gradual arterial occlusion. Repeated examinations of the ocular fundi failed to disclose any abnormality of the vascular pattern of retinal vessels as described by Takayasu. Further examinations of the blood and other routine biochemical tests showed no significant deviations from the normal. A full-thickness biopsy specimen, which included skin, subcutaneous tissue, abdominal skeletal muscle and a portion of the deep epigastric artery, was taken. Microscopic examination showed that these tissues were normal in appearance, as also was the wall of the deep epigastric artery.

It was decided to make a more detailed study of the arterial system by arteriography. This was performed by Dr. H. G. Hiller, Director of the Department of Radiology at the Royal Children's Hospital. His observations were as follows:

The subcutaneous nodules in the right forearm are along the course of the superficial veins, but the nodules did not expand under the pressure of the injected radio-opaque dye solution. The veins of the forearm

became markedly distended and tortuous and took 6 to 8 seconds to resume their normal calibre. In the actual arteriogram only the vessels of the pelvis and thighs were visualised, and complete absence of the dye from the right external iliac artery was demonstrated. There were areas of apparent narrowing alternating with areas of dilatation in the left external iliac artery. On the right side large anastomotic trunks, such as the gluteal and profunda arteries, were visible and the right femoral artery could be seen filling later in the upper thigh region.

Dr. Hiller concluded that veins as well as arteries were involved in the pathological process; the right and left iliac arteries were found to be involved to a notable degree.

The patient was discharged, after being in hospital for five months. A maintenance dose of cortisone, 12.5 milligrammes three times a day, was continued for a period of fourteen months. She remained reasonably well during that period, but was not completely normal in the opinion of her mother. During that time she sustained a fracture of the neck of the radius, which necessitated open surgical reduction. There was no radiological evidence of osseous rarefaction. Six months after the onset of the girl's illness a blood pressure estimation of the upper extremities was attempted by the "flush" method. The reading was 90 millimetres of mercury. During the seventh month examination revealed the presence of weak femoral pulses. The radial pulses and brachial pulses are still impalpable. The carotid pulses are still normal.

After fourteen months' treatment, it was considered justifiable to attempt to discontinue cortisone therapy. Cortisone was gradually withdrawn over a period of fourteen days. However, a rise in temperature occurred, nodules reappeared and a general constitutional disturbance developed. The reintroduction of cortisone brought about a rapid subsidence of symptoms and signs of active disease. As the erythrocyte sedimentation rate remained abnormally high and the total eosinophile cell count was not reduced, it was thought possible that the cortisone was not producing its full therapeutic effect. Therefore prednisolone was substituted, with striking benefit. In the words of her mother: "A miracle has been performed." The patient, for the first time since the onset of her illness, behaved like a normal child, being very active and interested in life.

Over the past few months enlargement of the spleen has been observed, but there has been no obvious progressive increase in size. At the present time a complete haematological study and biochemical investigation have failed to reveal any abnormality. The patient is now well. She is still being treated with prednisolone, five milligrammes twice daily.

Comment.

I have made a survey of the literature relating to the so-called "pulseless disease". I have not considered the occlusive diseases that affect older people, as I believe the aetiology to be different from that described in this case. The syndrome appears to be different from other occlusive arterial diseases such as atherosclerosis, *thromboangiitis obliterans* and Raynaud's disease. The case described herein has several of the features which characterized those originally described by Takayasu under the name of "pulseless disease of young females".

Svartz-Malmberg describes the case of a young girl, who presented with clubbing of the fingers which was apparently due to occlusion of the left subclavian artery. This was demonstrated by arteriographic examination and surgical exploration. In an addendum to Svartz-Malmberg's paper, the development of obstruction to the right subclavian artery is described, with resulting absence of the right radial pulse.

Summary.

1. An unusual case is described of a patient presenting with multiple subcutaneous nodules followed by occlusion of some of the larger arteries. This process appeared to be a gradual one, and the changes are probably permanent. The gradual occlusion allowed the development of adequate collateral circulation, which prevented gangrene.

2. The superficial veins are involved in the pathological process.

3. The small arteries and arterioles do not appear to be involved.

4. The use of cortisone caused the nodules to resolve and relieved the constitutional symptoms.

5. Prednisolone seemed to have a more beneficial effect than cortisone.

6. The ultimate prognosis is uncertain.

Acknowledgements.

I am indebted to my colleagues whose names appear in the text, for without their cooperation this report would not have been possible. To Miss R. Doig, medical librarian, who sought parallel cases in the medical literature, I extend my thanks. Dr. Reginald Webster has advised me in the final preparation of the report; for this, I am most grateful.

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Reviews.

Practical Clinical Psychiatry. By J. R. Ewalt, M.D., E. A. Strecker, M.D., Sc.D., LL.D., and F. G. Ebaugh, M.D.; Eighth Edition: 1957. New York, Toronto, London: McGraw-Hill Book Company, Incorporated. 9" x 6", pp. 478. Price: \$8.00.

In the preface to "Practical Clinical Psychiatry" it is stated that this text-book is written particularly for the medical student and the physician beginning his training in psychiatry. With each edition it has been thought desirable to increase the emphasis on psychodynamics, in order to keep pace with the increasing sophistication of the reader. The book is divided into three sections—*viz.*, theoretical considerations and medical psychology, systematic description of psychiatric illnesses, and treatment.

The book opens with a very promising chapter describing the organism, at first the single cell, and its relationship to the environment. The story unfolds, and within the first dozen pages one is introduced to the psychoanalytical vernacular and becomes familiar with libidinous strivings, death instinct, Oedipus complex and castration anxieties.

This Freudian orientation is continued throughout the book, and is to be found rather surprisingly in the chapters dealing with the psychoses. It is clear that the authors are in no way unaware of the limitations of the psychoanalytical concepts; but they appear to have developed this approach in order to effect a feeling of completeness. The student or recent graduate will certainly be impressed by this constant emphasis.

One chapter with the title "Organic Components of Behaviour" contains a considerable volume of information, chiefly of a theoretical nature, and introduced in an endeavour to draw attention to the environmental and cultural situations influencing human behaviour. There are also useful chapters on child psychiatry and mental health.

In the section on systematic description, the authors have given a clear and vivid account of the various clinical syndromes. This section is not improved upon by other text-books with similar objectives. The authors appear to be constantly aware of the difficulties that have to be surmounted by what they call the "neophyte".

The section on treatment is particularly well done. It provides information on various procedures, and special care and nursing details which would be most helpful to the beginner. Treatment of a particular syndrome is often referred to during the discussion of the clinical syndrome of this illness. One cannot fail to note a vagueness that would be anything but helpful to the student; *e.g.*, in reference to the treatment of *deltium tremens* it is advised that elimination and hydrotherapy, vitamin B, insulin and glucose therapy be stressed, and reliance on narcotic drugs be abandoned. Just how one is expected to cope with a sleepless, agitated and hallucinated patient is not clearly

stated until one finds the section on treatment at the end of the book.

The book is well recommended to those who appreciate the psychoanalytical concepts consistently and faithfully presented. It seems to be more suitable for post-graduate study, or for the sophisticated reader who likes his psychiatry well rounded off with Freudian concepts, than for the presentation of basic concepts to the medical student.

Clinical Electrocardiography: Interpretation on a Physiologic Basis. By M. Gargberg, M.D.; 1957. New York: Paul E. Hoeber, Incorporated. 10" x 7", pp. 335, with many illustrations. Price: \$12.75.

In this book the author endeavours to make the reader visualize the mechanism of production of the deflections of the electrocardiogram and the changes which are produced in them by various influences and lesions. He has based his studies on the conceptions and work of Lewis, Wilson, Ashman and Bayley.

In his illustrations the limb leads are constructed from the projection of the derived spatial QRS loops, while for the precordial leads he uses the solid angle method. It is therefore apparent that the accuracy of the deductions will depend on accurate vectorcardiography, to which he devotes a small chapter.

The most outstanding feature of this book is the author's method of projecting spatial vector loops on the Einthoven triangle by means of a mechanical device. He points out that the long axis of the loop is at right angles to the anatomical axis. Change in spatial orientation of the loop alters the frontal plane projection and therefore the form of the QRS complexes of the limb leads.

The idealized loop is cut out of plastic one-eighth of an inch thick and fastened to a rod representing the anatomical or long axis. The rod extends upwards past the loop so that a small model of the heart can be fastened to its tip. The rod is fixed on a stand, and a light is placed to cast the shadow of the zero point of the loop on the centre of the triangle. By means of the rod-rotation of the model heart through the various positions, the author shows the changing outline of the shadow of the loop and enables the corresponding limb lead variations to be constructed. His diagrams are supported by illustrative electrocardiograms. This method is ingenious, simple and very helpful in clarifying some doubtful pictures.

In the initial chapters the author deals with the electrical phenomena of the heart, depolarization of the ventricles and the formation of the various leads. He then discusses QRS-T relationships and gradient. He deals with the effects of injury and ischemia and then with ventricular hypertrophy and bundle branch block. He devotes his longest chapter to coronary disease, and goes on to discuss disturbances of the cardiac mechanism and the effects of drugs and electrolytes.

This is a fascinating book, which is of considerable assistance in sorting out the pathological from the physiological and the normal from the abnormal.

Practical Office Gynecology. By Albert Decker, M.D., D.O.G., F.A.C.S., and Wayne H. Decker, M.D., D.O.G.; 1956. Philadelphia: F. A. Davis Company. Sydney: Angus and Robertson, Limited. 9½" x 6½", pp. 404, with 103 illustrations. Price: £5 15s. 6d.

As is implied by the name, "Practical Office Gynecology", the subject matter of this book is predominantly concerned with diagnosis and treatment in the "office", and the management of the wide range of conditions discussed is indeed practical throughout.

After chapters on history taking and recording, and methods of physical and speculum examination, the authors (father and son) describe in detail the techniques of special examinations, such as the preparation of cytological smears, the use of the uterine sound in diagnosis, and methods of biopsy taking.

The chapters on hysterosalpingography, infertility and hormone therapy cover these subjects fully, while those on psychosomatic gynecology and premarital consultation, including contraceptive techniques, are valuable inclusions for the practitioner.

The indications for cul-de-sac puncture and culdoscopy, with detailed descriptions and diagrams of the techniques, provide some of the most useful parts of the book. Much emphasis is placed on the value of the knee-chest position for both examination and intravaginal therapy.

There is a list of axioms which indicate a long experience in gynecology, and a bibliography precedes the very full

index. As is admitted by the authors, a certain amount of repetition is inevitable.

Some statements warrant question. Curettage, or hysterotomy, is advised for the stubborn persistence of a missed abortion. Hydatid mole is said to require follow-up examinations and pregnancy tests for five years, monthly during the first year. Though the chapter on backache stresses the usual finding of orthopaedic disorder, yet too many gynecological lesions, anatomical and pathological, are allowed the possibility of causing severe backache. Advice is given that biopsy to exclude cancer must be carried out before the treatment of *krawosis vulvae* is begun, while later the condition is admitted to be unrelated to cancer.

There are numerous mistakes in spelling, chiefly in proper names and Latin words. However, the book is beautifully produced.

Though the purpose of this book is primarily to help the general practitioner, and to serve as a reference guide for specialists in other fields, the scope of out-patient gynecological practice is fully covered with a wealth of sound advice, and there is much material of interest and importance to the gynecological specialist.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Practical Otolaryngology", by Gervais Ward McAuliffe, M.D., F.A.C.S., F.I.C.S.; 1957. New York: Landsberger Medical Books, Incorporated, distributed by The Blakiston Division of the McGraw-Hill Book Company. 8" x 5½", pp. 320, with 12 plates. Price: \$7.00.

"This book is written for the general practitioner. It is in no sense a text book."

"Progress in Psychotherapy. Volume 2: Anxiety and Therapy", edited by Jules H. Masserman, M.D., and J. L. Moreno, M.D.; 1957. New York and London: Grune and Stratton. 9" x 6", pp. 272. Price: \$7.50.

The scientific proceedings of the 1956 Section on Psychotherapy of the American Psychiatric Association plus chapters on specific aspects of psychiatric treatment.

"Peripheral Circulation in Health and Disease", by Walter Redisch, M.D., F.A.C.P., and Francisco F. Tangco, M.D., B.S., with a special section by R. L. deC. H. Saunders, M.D., F.R.S.E.; 1957. New York: Grune and Stratton. 10" x 7", pp. 160, with 25 illustrations. Price: \$7.75.

Intended for medical students, workers directly concerned with the subject and practitioners of general medicine.

"Systemic Arterial Embolism: Pathogenesis and Prophylaxis", by John Martin Askey, M.D.; 1957. New York and London: Grune and Stratton. 8½" x 5½", pp. 168, with 22 illustrations. Price: \$5.75.

An attempt to gather together the pertinent material on the subject in a convenient form.

"Schizophrenia in Psychoanalytic Office Practice: The Society of Medical Psychoanalysts, 1956 Symposium", edited by Alfred H. Rifkin; 1957. New York and London: Grune and Stratton, Incorporated. 9" x 6", pp. 160. Price: \$4.00.

Papers and discussion from a symposium held in New York by the Society of Medical Psychoanalysts.

"Principles of Immunology", by John E. Cushing and Dan H. Campbell; 1957. New York, Toronto, London: McGraw-Hill Book Company, Incorporated. 9" x 6", pp. 358, with 16 illustrations. Price: \$6.50.

For the student, undergraduate and post-graduate.

"The Family in Psychotherapy", by C. F. Midelfort, M.D.; 1957. New York, Toronto, London: The Blakiston Division, McGraw-Hill Book Company, Incorporated. 8" x 5½", pp. 216. Price: \$6.50.

The approach considers the patient and his whole family as the treatment unit, rather than the patient alone.

The Medical Journal of Australia

SATURDAY, OCTOBER 26, 1957.

THE CANADIAN MEDICAL SERVICES IN WAR.

THE official history of the Canadian Medical Services in the war of 1939 to 1945 is completed in two volumes under the editorship of Lieutenant-Colonel W. R. Feasby. Volume II, dealing with the professional and clinical aspects of the Services and of civilian medicine during the war period, was published first, and was reviewed in this Journal about three years ago.¹ Volume I has now appeared,² as a handsome production, to cover the aspects of organization and campaigns. The volume warrants special note.

There are now separate medical services for Navy, Army and Air Force in Canada, with a Dental Corps which functions for all three Services. In 1939 the Royal Canadian Army Medical Corps was responsible for all medical and dental services required by the Canadian Armed Forces, and the present volume deals with its expansion to meet the unprecedented demands. A short sketch of early army medical activities begins with the north-west rebellion in 1885, and refers to a contingent sent to the Boer War. Later years found growing interest in Army Medical Services, which, as in other colonies, were modelled on those of the British Army; but in 1914 the Canadian Regular Army numbered only 3000 with a small permanent medical administrative staff—militia were more numerous, but of varying efficiency. However, by June, 1918, there were 1386 medical officers serving overseas in 68 medical units, and there were 65 military hospitals in Canada.

Some of the difficulties which accompanied this rapid expansion are referred to, particularly an abortive attempt to bring the Army Medical Services under more or less direct civilian control at home and abroad. In the early inter-war years the keynote of defence policy was, as elsewhere, rigid economy. The Army Medical Services undertook the complete administration of the medical and dental services of all Canadian Armed Forces, and functioned in fact as part of the national health service. To these services, for example, was delegated responsibility for medical examination of commercial and private pilots and for lecturers in the larger cities on medical aspects of civil aviation. In the financial depression years the Army Medical Services undertook the medical organization and administration of unemployment relief camps, which in all accommodated 170,000 men; and later the provision of hospital and specialist services for the Royal

Canadian Mounted Police was added to its duties. As these were quite beyond the capability of the permanent staff, part-time militia and civil doctors were frequently coopted, and existing civilian hospitals eked out the scanty accommodation in military institutions. By 1936 the inevitability of war made increased defence appropriations essential, recruiting was speeded up and training improved. A general mobilization plan, including provision for a possible expeditionary force, was completed; however, medical planning lagged, partly because equipment was lacking, but in particular because of disputes regarding the necessity for military hospitals when beds were available in existing civil hospitals. Discussion, which centred largely on problems of disciplinary control, was prolonged, and a satisfactory compromise was not evolved until after the outbreak of war.

Within three months of the declaration of war in September, 1939, the First Canadian Division had arrived in England; but more than three years were to elapse before any considerable number of these troops went to a theatre of war. The problems of medical treatment in England and of integration with the British Army are discussed at length. The most interesting section of the volume is that devoted to an account of all the major campaigns in which the Canadians participated, from the disastrous Dieppe raid of August, 1942, through the fighting in Sicily, southern Italy and the Adriatic sector, the Normandy landing, the pursuit through Belgium, the Rhineland fighting and the final phase until the complete withdrawal of the Canadian force in May, 1946. These campaigns have, of course, been described elsewhere; but in this instance the emphasis is on the part played by the Canadian Army Medical Service, and the value of this graphic account is greatly enhanced by a series of excellent maps unsurpassed in any of the medical histories of this war. The story of the very gradual development of a successful antimalarial policy in Sicily will be read with particular interest by many Australian medical officers. The account of the experiences of the small medical component of the Canadian force in Hong Kong shows that its members shared the discomforts and privations of prison camps with the same fortitude as other members of the defending force.

The Royal Canadian Navy has prepared for the volume a short chapter which does bare justice to a notable war effort by over 100,000 personnel. More satisfactory are the chapters devoted to the medical branch of the Royal Canadian Air Force. It did not attain an independent existence until September, 1940, and its rapid growth, together with the increasing complexity of the problems of aviation medicine, was a severe test for the original staff. Not the least of these problems was the medical organization and administration of the British Commonwealth Air Training Scheme, in which many pilots and air crews from Australia were trained. In all 131,553 men graduated from this school, 55% of them Canadians, and if one may judge from the wealth of statistical material regarding morbidity and hospitalization, the medical documentation must have been remarkably complete.

A succinct account of the rapid expansion and manifold activities of the Canadian Dental Corps, which adequately supplied the dental needs of all the Canadian armed forces throughout the war, amply justifies its independent

¹ M. J. AUSTRALIA, 1954, 1: 866 (June 5).

² "Official History of the Canadian Medical Services, 1939-1945"; Volume I, Organization and Campaigns; edited by W. R. Feasby, B.A., M.D.; 1956. Published by authority of the Minister of National Defence. 10" x 6½", pp. 580. Illustrated with paintings and photographs by Canadian war artists and photographers; maps drawn by Captain C. C. J. Bond. Price: \$5.00.

existence. All the ancillary services of the forces—nursing, physiotherapy, occupational therapy etc.—are given due praise, and the valuable cooperation of the St. John and Red Cross organizations is gratefully acknowledged. Finally, the Air Raid Precautions and various other civil health and welfare organizations established during the war are discussed briefly.

Careful consideration is given to the difficulties of medical examination and classification of recruits and of serving soldiers. All the combatant nations felt the strain on limited manpower caused by rapid expansion of the armed forces; but in Canada the approach to the problem of personnel selection was more realistic and competent than anywhere else. The result was the evolving of the Pulhems System, which the recorder is proud to claim as "wholly a Canadian Army project", and which has been adopted with modifications by British, United States and other armed forces. In Australia its influence is seen in the increasing emphasis now placed on intellectual capacity and emotional stability in the selection of candidates for training as officers.

Colonel Feasby, with his well-chosen staff, has covered a very wide field in the 568 pages of this volume. He has succeeded in presenting a well-balanced, authoritative, factual account of the problems and achievements of the Canadian Medical Services, which, apart from its general appeal, will be read with special interest by those who were faced with similar problems in the Australian Imperial Force. They will fully understand Colonel Feasby's words to their Canadian colleagues: "The accounts are as factual as painstaking research can make them; those who served through the heroic period of history encompassed in these pages will be able to read, between the cold, hard lines, the story of those very personal and colourful events which live in their memories."

Current Comment.

THE PHARMACOLOGICAL AND MEDICAL ASPECTS OF SMOKING.

THE supposed evil effects of smoking in relation to lung cancer have lately been very much in the news, but it is difficult to obtain unbiased opinions about other possible ill effects of the habit. It is therefore interesting to note that the Royal Society of Medicine¹ has recently had a discussion on the pharmacological and medical aspects of smoking, during which Professor J. H. Burn discussed the pharmacology of smoking, R. Doll discussed smoking and lung cancer and N. Oswald discussed the medical effects of smoking.

Many estimates have been made of the amount of nicotine absorbed by a man in smoking a cigarette. Published results seem too high, and Burn has reexamined the subject. He and his co-workers found that the amount of nicotine entering the mouth during the smoking of one cigarette, containing one gramme of tobacco, was between 0.6 and 1.0 milligramme. In other experiments it has been determined that with deep inhalation only about 0.3 milligramme of nicotine enters the blood during the smoking of a British cigarette. Smoking raises the heart rate and the blood pressure partly as the result of release of adrenaline and nor-adrenaline. The rise in blood pressure

is due, in the main, to peripheral vasoconstriction. The skin temperature falls somewhat. These changes are important in subjects with *thromboangiitis obliterans* and Raynaud's disease. The most serious suspicion regarding nicotine concerns its effect on the coronary circulation. Nicotine stimulates the supraoptic nucleus and causes a discharge of vasopressin from the posterior lobe of the pituitary gland. Vasopressin causes constriction of the coronary vessels. Burn has determined approximately the amount of vasopressin in the blood after cigarette smoking and finds sufficient to affect the coronary vessels to a quite marked extent. All the findings, including electrocardiographic and ballistocardiographic, point in the same direction—that nicotine has an effect on the heart which, while harmless in the young and healthy person, is harmful to those who are older and especially to those with coronary disease. Burn concludes with "an expression of surprise that doctors seem often disinclined to tell their patients not to smoke", particularly patients with *thromboangiitis obliterans* and coronary disease.

N. Oswald also has stressed the effects of nicotine seen clinically in relation to peripheral vascular disease and *angina pectoris*. He points out that while nobody would claim that these diseases are caused by smoking, a period of abstinence often leads to gratifying results. *Thromboangiitis obliterans* bears a direct relation to smoking, so smoking should always be forbidden in the presence of this disease. Most of the other effects of smoking are relatively unimportant and are to a large extent counterbalanced by the pleasant effects. Smoking in relation to chronic bronchitis is difficult to assess, for there is no satisfactory definition of chronic bronchitis. Still, observations have shown a greater incidence of bronchial disorders in smokers, and an aggravation of the bronchitis by smoking. The excessive formation of bronchial mucus which is caused by smoking among other things inevitably leads to a predisposition to bronchial infection, the so-called "resistance lowering effect" of mucus.

R. Doll gives a clear account of present beliefs concerning the relation of smoking to lung cancer as deduced from statistical investigations; but this has frequently been dealt with lately and need not detain us now. A point of view that appeals to many is that expressed by Oswald, who suggests that too wide generalizations should be avoided until more is known of the factors which influence the development of lung neoplasms. Quite reasonably he comments: "Clearly the application of statistical methods can do no more than define the problem."

BRONCHODILATORS.

A USEFUL SUMMARY of the action and practical application of bronchodilator drugs has been presented by R. S. Bruce Pearson,² who points out that a wide choice of these drugs is available and suitable selection must be made according to circumstances. He discusses in turn the sympathomimetic drugs, the xanthine derivatives, the belladonna group, the nitrites, pethidine and khexalin. He states that the antihistamine drugs have proved a relative failure as bronchodilators in the management of asthma. Corticotrophin and corticosteroid preparations have no direct bronchodilator action, but they come in for mention because of their place in the management of asthma. For the prevention of nocturnal attacks Pearson recommends the oral administration of ephedrine, aminophylline or a combination of these. He advocates the intravenous administration of aminophylline in doses of 0.25 to 0.5 gramme. For patients who are intolerant of the effects of ephedrine on the central nervous system or the heart, he suggests the substitution of methoxyphenamine ("Orthoxine"). This is a relatively new analogue of ephedrine, which has a more potent bronchodilator action and less cerebral and cardio-vascular effects. It is prescribed in the form of tablets in doses of 50 to 100 milligrammes. To

¹Proc. Roy. Soc. Med., 1957, 50:7 (July).

²Practitioner, 1957, 178:70 (January).

abort minor attacks of asthma, Pearson states that the drugs already mentioned or isoprenaline in an atomizer are usually effective. If the attacks are more severe, small doses of adrenaline may be given subcutaneously. When spasm is associated with bronchial infection, a mixture containing stramonium and potassium iodide or elixir of caffeine iodide is regarded as preferable. If the infection is heavy, antibiotics must be employed. In severe attacks or in *status asthmaticus* Pearson recommends the repeated subcutaneous injection of adrenaline or the intravenous injection of aminophylline. For patients who have failed to respond to these measures he states that corticotrophin or cortisone will usually be effective unless emphysema is severe, or there is heavy bronchial infection. The use of these steroid preparations is, of course, not to be undertaken lightly, and they should be given only with the greatest care when clear indications exist. Pearson states that, except as a life-saving measure, they should not be used even for short periods in patients with recently active tuberculosis, peptic ulcer, nephritis or psychotic tendencies. They are less likely to be effective when there is gross bronchial infection, and in these circumstances they should be given with antibiotics. The two new analogues of cortisone and hydrocortisone, prednisone and prednisolone, have some advantages over naturally occurring steroids.

THE FATE OF SOME EARLY AMERICAN PRESIDENTS.

AMERICAN MEDICINE in the revolutionary period was remarkably primitive, as is made clear by Charles W. Robertson¹ in an address on presidential illnesses. The final illness of the first President, George Washington, in 1799 is an outstanding example of the limitations of that day. In common with most people of his time he had had numerous illnesses—diphtheria, pleurisy with effusion, smallpox, malaria and a variety of chronic diarrhoeas. Recurrent respiratory infections had convinced him that he should not serve a third time of office. His final illness began on the night of Friday, December 13, 1799, and it lasted for only 24 hours. He was then 68 years of age. On the Friday morning General Washington rose in good health apart from a cold, but after a short walk he complained of unusual pain in his throat and he went to bed. The pain in the throat was accompanied by a rigor, cough and painful deglutition, soon giving place to fever and dyspnoea. The treatment given was incredible. The patient was relieved of 32 ounces of blood "without the smallest apparent alleviation of the disease", but his exsanguinated condition led to his rapid and passive demise. Calomel and tartar emetic were the only drugs given, in large doses. A bran and vinegar poultice was applied to his throat, and vinegar and water inhalations were given. There is little wonder that the acute streptococcal tonsillitis with laryngeal oedema that he in all probability was suffering from was fatal.

William Henry Harrison was the first President to die in office. He died just a month after his inaugural address given on March 4, 1841. Robertson tells us that during this time he developed a chest cold; however, the resulting pneumonia was reported to have cleared after he was "leached and cupped profusely". Then intestinal inflammation possibly with hepatitis set in; for these there was no treatment, and he succumbed to them.

Abraham Lincoln was assassinated on April 14, 1865, in a dramatic incident that is too well known to need retelling. At that time pus was regarded as laudable and an essential step in wound healing; aseptic precautions were therefore absent from the surgical management. His serious condition was still treated at home, and the bullet wounds were dealt with by masterly inactivity. Apart from the initial mouth-to-mouth insufflation and gentle probing of the wound it was realized that nothing could be done to save his life, and he survived for only ten hours.

Robertson states that since the inauguration of George Washington there have been 33 Presidents, and if we exclude those assassinated in office (three), the average survival age has been 69.9 years. This is a satisfactory figure for any major executive group. Of the 33 only four died in office; so the office does not appear to be loaded with excessive strain in spite of the functions of the President.

RECTAL BLEEDING AND DIVERTICULITIS OF THE SIGMOID COLON.

THE relationship between rectal bleeding and diverticulitis of the sigmoid colon is important in diagnosis and treatment, but ideas on it are not generally as clear as might be wished. Between 1946 and 1953 J. De Cosse and F. Amendola² operated on 43 patients for diverticulitis of the sigmoid colon; in each case there was a clear statement that rectal bleeding had or had not occurred, and in each case a surgical specimen of the sigmoid colon was submitted for pathological examination. Twelve of the patients had experienced rectal bleeding, but in no instance was it of a massive kind. In six of these twelve patients the cause of hæmorrhage was due to single or multiple polypi in the sigmoid colon. In two of the twelve patients the bleeding was explained by pathological lesions other than diverticulitis: one was found to have an active duodenal ulcer; the other had hemorrhoids and an anal fissure and had remained asymptomatic for several years. The remaining four of the twelve patients had no other source of bleeding than the diverticulitis.

As a result of these studies De Cosse and Amendola conclude that rectal bleeding occurs uncommonly from diverticulitis of the sigmoid colon. When present it is usually traceable to other causes, principally adenomatous polypi. In the presence of bleeding for which no cause other than diverticulitis can be demonstrated, they consider that surgical excision of the diseased portion of the colon should seriously be recommended. They state that the resected specimen will generally show some other source of bleeding or, less frequently, an advanced inflammatory change due to diverticulitis, which of itself would justify partial colectomy.

PSYCHOPHARMACOLOGY.

LAST year a Psychopharmacology Service Center was established with the Research Grants and Fellowships Branch of the National Institute of Mental Health in the United States of America. Its purpose is to implement a broad programme of basic and clinical research to increase understanding of the mechanisms of action, efficacy and limitations of the tranquillizing and other centrally acting drugs. As one way to stimulate and facilitate research, the Center has organized a general clearing-house for information on psychopharmacology. An extensive collection of the literature in this field, including pharmacological, clinical, behavioural and experimental studies of the ataraxic, psychotomimetic and other centrally acting drugs, will be classified and coded to enable the staff to answer a wide variety of technical and scientific questions. As soon as enough materials have been assembled, the Center plans to offer bibliographic and reference service as well as the preparation of critical and analytic reviews of special topics in the field.

In order to accelerate the growth of the literature collection, the Center invites persons working in this field to provide three copies of any papers that deal with their work—whether reprints, pre-publication manuscripts, progress reports, informal mimeographed reports, papers read at meetings or abstracts. Letters outlining work in progress would also be welcome. Any restrictions that authors may wish to place on the Center's use of their papers will be strictly observed. All materials should be addressed to the Technical Information Unit, Psychopharmacology Service Center, National Institute of Mental Health, 8719 Colesville Road, Silver Spring, Maryland.

¹ *Boston Med. Quart.*, 1957, 8: 33 (June).

² *Ann. Surg.*, 1957, 145: 540 (April).

Abstracts from Medical Literature.

GYNÆCOLOGY AND OBSTETRICS.

Significance of the Signs of Fetal Distress.

S. J. GINSBURG (*Am. J. Obst. & Gynec.*, August, 1957) has studied the significance of the signs of fetal distress in a total number of 1363 deliveries with 152 instances of possible fetal distress—an incidence of 11.2%. The total intra-partum and neonatal mortality following the signs was over twice that of the general population. Most common factors to account for the signs were accidents to the cord, labour defects, disproportion, spasm due to "Pitocin" and placental accidents. Age, parity, prematurity and post-maturity were not important factors. Meconium-stained liquor in vertex presentations without any other signs indicated a generally favourable outcome; but slowing of the fetal heart rate below 100 per minute indicated significant fetal distress. Meconium staining in addition to a slowed heart rate indicated even more severe trouble. A rapid heart rate, above 170 per minute, did not signify severe fetal distress; but the presence of meconium staining as an additional factor did indicate some increase in fetal jeopardy. Fluctuation of the fetal heart rate by 40 beats per minute within the limits of 100 to 170 per minute with meconium staining did not appear to indicate fetal distress. In the 152 cases of fetal distress, two babies (1.3%) were stillborn, four babies (2.6%) died in the neonatal period, 28 babies (18.4%) were affected at birth, and four babies (2.6%) were in poor condition after four days.

Routine Cervical Smear Examinations in Pregnancy.

T. A. SLATE, P. L. MARTIN AND J. W. MERRITT (*Am. J. Obst. & Gynec.*, August, 1957) present the results of a study made of cervical smears taken from 5935 pregnant women. In this group 45 abnormal smears were detected. The authors divide their cases as follows: Classes 1 and 2, no malignant disease; Class 3, equivocal—for example, benign atypical hyperplasia; Class 4, probable carcinoma; Class 5, definite evidence of carcinoma. A total of 13 unsuspected preinvasive and one unsuspected invasive carcinomata was found among the patients. The evidence from the study seemed to indicate that definitely abnormal smears (Class 4 and Class 5) will remain practically the same in the post-partum period, and abnormal or atypical histological findings will be revealed after pregnancy. Abnormal lesions, such as premalignant dysplasia and preinvasive carcinoma, are definite pathological changes and will persist during pregnancy if not treated; in seven out of the 22 cases in which Class 3 or equivocal smears were obtained, the findings reverted to negative after delivery. The finding of an abnormal smear during pregnancy seems to be a more accurate test than one or two punch biopsies

taken at random. In three cases the biopsy showed chronic cervicitis, whereas complete biopsies in the post-partum period showed preinvasive carcinoma. A pregnant patient with a normal-appearing cervix and Class 3 findings in a cervical smear may be safely followed into the post-partum period before diagnosis and treatment are carried out. However, all cervixes showing grossly suspicious or malignant changes and a Class 5 smear should be examined by biopsy to rule out invasive carcinoma.

Cervical Incompetence in Pregnancy.

W. F. BADEN AND E. E. BADEN (*Am. J. Obst. & Gynec.*, August, 1957) review the types of cervical incompetence in pregnancy and their treatment. This condition may be classed as complete or incomplete, the former type involving the entire cervix, the latter only the supra-vaginal or vaginal portion of the cervix. The authors estimate that cervical incompetence of surgical degree occurs once in approximately every 300 consecutive pregnant women. Only frequent vaginal examinations bring the gradually dilating cervix into clinical consideration in time to correct the situation. Any cervix dilated over 1.5 centimetres prior to the twenty-eighth week of gestation should be considered incompetent, and repair should be considered. Treatment consists of careful trachelorrhaphy. This is best done after the third month to exclude faulty conceptions. Should labour occur in the immediate post-operative period, the sutures need only be cut and delivery can proceed. Bed rest is of the utmost importance, and should be maintained if at all possible until definite viability of the infant is assured.

Congenital Absence of the Vagina.

J. D. THOMPSON, L. R. WHARTON AND R. W. TELINDE (*Am. J. Obst. & Gynec.*, August, 1957) present an analysis of 32 cases in which congenital absence of the vagina was corrected by the McIndoe operation. This operation has three main principles: (i) dissection of an adequate space between rectum and bladder; (ii) inlay grafting; (iii) continuous prolonged dilatation during the contractile period of healing. In inlay grafting the cavity must be prepared with care, there must be no non-viable tags which could not receive a graft, haemostasis and asepsis must be absolute and the graft must be applied to the dissected space over a form with even pressure exerted over the whole surface of the graft; the graft must also be as thin as possible. Under no circumstances must the form be left out of the vaginal cavity for more than a few minutes at a time, until all tendency to constriction has ceased. The graft, once contracted, never expands, and cannot be made to do so by mechanical means. Two points in technique are emphasized: (i) in dissection of the space there is danger of injuring the urethra, bladder or rectum; (ii) it is important to distinguish between congenital absence of the vagina and uterus and cryptomenorrhoea resulting from an imperforate hymen. In the authors' series successful results were obtained in approximately 81%. Except for three recto-vaginal fistulae, urethral

sloughing in two cases and one post-operative hemorrhage, there were no other serious complications. The recto-vaginal fistulae were successfully repaired.

Prolapse of the Umbilical Cord.

E. E. DILWORTH AND J. V. WARD (*Am. J. Obst. & Gynec.*, August, 1957) review 66 cases of prolapse of the umbilical cord in 19,893 deliveries, both at term and premature. This is an incidence of 0.3%, or one in every 302 deliveries. Of these patients, 25 were treated by Caesarean section, and 5.8% of all Caesarean sections were performed for treatment of prolapse of the umbilical cord. All fetuses weighed 1000 grammes or more, and there was no maternal mortality. Abnormal presentation, especially footling breech, is the most common predisposing factor, and the amount of dilatation of the cervix and the station of the presenting part are of prime importance in determining the method of treatment. The changes which have occurred in recent years in the management of prolapse of the umbilical cord are almost entirely a result of the increased safety of Caesarean section; this has almost removed the need for the dangerous and usually unsuccessful vaginal surgical procedures. A fetal mortality of 12% was achieved in 25 cases managed by Caesarean section. The intranasal administration of oxygen, the use of the Trendelenburg position and manual displacement of the presenting part are useful adjuvant procedures.

Exfoliative Cytology in the Diagnosis of Carcinoma of the Cervix Uteri.

E. H. DALE, O. A. BRINES, G. S. WILSON AND H. M. NELSON (*Am. J. Obst. & Gynec.*, July, 1957) report the results of systematic and routine use of Papanicolaou smears in the diagnosis of cervical carcinoma. Over a period of four and a half years 15,832 women were examined in this way in the "cancer detection" centre of the Yates Memorial Clinic. The examination was primarily for the recognition of early cancer in presumably asymptomatic patients. Smear findings were classified as "negative", "atypical", "suspicious" or "positive". An histopathological diagnosis of carcinoma of the cervix was made in 151 of these cases (0.95%). The findings in 160 Papanicolaou smears were reported as "positive" and 77 as "suspicious". Of cervical biopsies, 87.8% confirmed the positive smear diagnoses, and 8.6% were non-confirmatory. The remaining 3.6% of smears must be regarded as so-called false-positives, or preferably, as termed by the authors, "unconfirmed positives". Of 77 cases in which smear findings were "suspicious", in 52.9% of those in which biopsy was performed the findings were positive, and in 11.8% questionable. There were seven false-negative smears in this series. Only one of these cytologically missed cases was in the pre-invasive stage. The following factor may dispose towards error in false-negative results: too thick smears, heavy blood content of smears, and the presence of severe necrosis which militates against finding fresh, well-preserved cells in the smears. The authors noted a substantial prevalence of cervical cancer in younger

patients in the series. Of 151 proved cases, 34.4% were found in patients below the age of 40 years. Moreover, half the growths in patients aged under 40 years had progressed beyond the intraepithelial stage. Only one-fifth of the growths in patients aged over 40 years were in the preinvasive stage. Of all cases of preinvasive squamous-cell carcinoma of the cervix of this series, approximately 75% were first detected by smears. The authors emphasize how little correlation there is between clinical and pathological diagnosis in cancer of the cervix. History and physical examination alone are not considered reliable methods for its diagnosis.

Occult Carcinoma and Pre-Menopausal Abnormal Uterine Bleeding.

J. N. MILLER AND R. C. BENSON (*West. J. Surg.*, May-June, 1957) report a study of 647 premenopausal women with abnormal uterine bleeding investigated by cervical biopsy and surgical curettage. These patients were treated at the University of California Medical Center during the five-year period 1951 to 1955. Women aged over 50 years were excluded, together with patients suspected of pregnancy complications, patients with visible lesions of the cervix and patients with cancer-positive vaginal smears. In this series there were 12 occult squamous carcinomata of the cervix and eight adenocarcinomata of the endometrium. All the occult malignant lesions were small; three of the 12 cervical cancers were intraepithelial growths (Stage "0"), the remainder were classified as Stage I. Factors such as the age of the patient, the type of menstrual aberration and gross pelvic findings were of no positive value in the diagnosis or exclusion of cancer of the cervix or fundus uteri in this series. The authors found that carcinoma was often associated with other disorders, and abnormal bleeding was related to benign or malignant causes, or to a combination of the two. Uterine irregularities or adnexal masses were not found to decrease the possibility of the presence of cancer in the cervix or endometrium. The authors emphasize the importance of routine vaginal smear examination, examination under anaesthesia, multiple cervical biopsies and uterine curettage at a time when optimal treatment and arrest can be ensured. Major surgical, hormonal or radiotherapeutic measures should be postponed until all pathological reports are available in order to avoid the possibility of untimely or inadequate surgery.

Endometrial Lavage in the Diagnosis of Carcinoma of the Endometrium.

D. G. MORTON, J. G. MOORE AND N. CHANG (*West. J. Surg.*, May-June, 1957) describe a lavage method for obtaining a better sample of cells from the endometrial cavity for the purpose of screening for endometrial carcinoma. Vaginal smear examination has been found unreliable for the detection of carcinoma of the endometrium, in contrast to its spectacular value in the detection of cervical cancer. A small quantity of sterile saline solution is injected into the uterine cavity and the

return flow is aspirated from the posterior fornix. Smears are then fixed and stained by the Papanicolaou technique. The total number of lavage specimens examined was 797 from 673 patients with histories of irregular bleeding. The results were classified as "negative", "suspicious" and "positive". During the course of this investigation cancer of the uterine cavity was accurately diagnosed in 24 out of 26 histologically proven cases. By this method endometrial cells were identified in 84% of investigations, while such cells were found in only 8% of vaginal smears taken on the same patients. The criteria of malignancy were those described by Papanicolaou and Traut, and representative examples from the series are illustrated. The endometrial lavage specimen was "suspicious" or "positive" in 24 of 26 proven cases; the accompanying vaginal smear was "positive" in only 10 cases. There were only two false-negative lavage results in the series, but 11 false-suspicious or false-positive results. The observers found that certain types of cells were repeatedly called "suspicious" or "positive" in error, since cancer was not subsequently found. Among 145 post-menopausal patients in the series, there were 26 with cancer diagnosed by endometrial lavage and 29 with cancer proven histologically. Curettage is considered necessary for a definitive diagnosis; but endometrial lavage offers a better method of sampling the endometrial contents than vaginal smear or endometrial aspiration techniques. The authors consider that this simple office procedure could be of great assistance in the management of irregular and excessive menstruation and of intermenstrual "spotting" at or near the menopause. Cancers of the endometrium are not likely to be missed (92% accuracy), though endometrial lavage examination may falsely indicate the possibility of cancer in a small proportion of cases.

The Hazards of Intrauterine Pessaries.

R. W. WEILERSTEIN (*West. J. Surg.*, May-June, 1957) reports an evaluation of the intra-cervical and intrauterine use of pessaries on the basis of replies to a questionnaire sent by the Federal Food and Drug Administration, Bureau of Medicine, to geographically selected diplomates of the American Board of Obstetrics and Gynecology. These pessaries are chiefly used in contraception; but uterine stem pessaries are occasionally used in the treatment of dysmenorrhoea, in the correction of stenosis of the cervix, and in selected cases of sterility. Such pessaries are available through surgical supply firms and comprise coil springs, button or disk-end pessaries, stem and wishbone varieties. Questionnaires were sent to 187 diplomates, and 129 replies were received; these permitted an analysis of 179 cases reported in which deleterious effects followed the intrauterine use of pessaries. Among 129 physicians who replied, 101 were opposed to the continued distribution of pessaries for intra-cervical insertion for any medical purpose. Eighteen physicians were opposed to their use, but considered it legitimate under certain circumstances. Nine physicians favoured

the continued intra-cervical use of pessaries, but thought that some restriction should be observed, and one physician considered them to be absolutely safe and efficacious. The following five distinct types of sequelae were described among 179 patients wearing pessaries within the cervix: there were 126 cases of pelvic infection or its complications; 30 patients suffered from trauma due to irritation, embedding, perforation or migration of the pessary; 15 cases involved pregnancy and its complications including several ectopic pregnancies; six cases of carcinoma of the cervix were found in patients wearing these pessaries. The author considers that the chief hazards in the intrauterine use of pessaries are as follows: (i) loss of control over the patient following the insertion of such pessaries; (ii) cervical ulceration, which may predispose towards cancer; (iii) migration of the foreign body and the risk of pelvic infection. The conclusion is drawn that the hazards outweigh the advantages of the intrauterine insertion of pessaries in the treatment of dysmenorrhoea and antelexion of the uterus. The consensus of this group of informed experts overwhelmingly condemns the continued intra-cervical and intrauterine use of pessaries as a method of contraception.

MORPHOLOGY.

Growth of Brain Case.

L. W. MEDNICK AND S. L. WASHBURN (*Am. Phys. Anthropol.*, June, 1956) discuss the two conflicting theories concerning the growth of the mammalian brain case. According to one, the cranial sutures are important sites of growth, while, according to the other, surface apposition and internal resorption account for most of the growth of the brain case. The skull growth of the infant pig was studied by means of the alizarin red-S vital staining technique. The study demonstrates the major role of the sutures in the growth of the brain case during the early period of brain development. Secondary growth processes of apposition and resorption are responsible for increasing the thickness of the bones and for the production of diploic and sinus spaces.

Skeletal Variations of the Toes.

P. VENNING (*Am. J. Phys. Anthropol.*, March, 1956) reports radiological studies of variations in the number of phalanges and centres of ossification of the toes. The skeletal structures of the second, third, fourth and fifth toes, however, vary with respect to both these characteristics. Each of these toes may consist of either two or three phalanges. The second, third and fourth commonly have three phalanges and only rarely two, while among fifth toes both types occur with nearly equal frequency in Europeans. In addition, there is a variation in the number of centres of ossification that develop in the middle phalanx of toes with two phalanges. An analysis is presented of these skeletal differences observed in a collection of radiographs of the feet of children and adults of both sexes.

Brush Up Your Medicine.

ON BIOPSIES.

Biopsy is a common diagnostic procedure used by surgeon, physician, gynaecologist, urologist and dermatologist, but is dependent on the skill and experience of the pathologist. Although it is a minor operation, its importance is obvious in the correct diagnosis of many conditions.

Tissue biopsy can be performed by simple incision or excision, by needle aspiration, punch and drill. Although some of these procedures are harmless, the method requires selection, as there are risks of cell dissemination and local technical complications, while incorrect reports from inadequate material may lead to erroneous conclusions and wrong therapy.

The fertile investigations of the modern physician have been widened to include aspiration biopsies of many organs, including liver, stomach, duodenum, kidney, marrow and rectum. Hazards such as hemorrhage and biliary peritonitis in biopsies of the liver must be accepted if the evidence to be gained is worth while. Needle aspiration is more commonly used, as a wedge taken from the edge of the liver at operation may not be truly representative.

Cell dissemination is particularly to be guarded against when one is dealing with some forms of malignant disease, and it may be categorically stated that piece biopsy of malignant skin melanoma and of tumours of the testis and breast should not be countenanced. This is particularly true when ablative surgery or some form of irradiation of an early primary neoplasm is not immediately undertaken.

Examination by frozen section can be of tremendous aid; but in doubtful lesions a wise pathologist will postpone his final opinion pending the rapid preparation and examination of paraffin sections. Generally it may be stated that when the histological picture is difficult, then frozen section examination is not acceptable. The technique is not suitable for soft papillary tissues, such as villous tumours of the bladder, which do not cut well. The dangers of a false positive or incorrect negative finding are evident, and it seems only fair to give the pathologist the essential clinical features. The specimen should be taken from the base or edge of the lesion, and careful handling of tissues is necessary for better histological results. Necrotic and distorted tissues may lead to difficulties of interpretation.

The exfoliative cytological findings may be a useful adjunct in the examination of ascitic fluid, gastric washings and sputum, and in the early diagnosis of cancer of the cervix and prostate, but this method appears to have a limited field.

Six of 22 patients who had recently undergone incomplete excisions for biopsy or for therapeutic purposes, and who were admitted to the Special Unit for Investigation and Treatment (New South Wales State Cancer Council) for malignant melanoma of the skin, presented with local recurrences and thereby a worsened prognosis. There is only one rule for suspected superficial skin melanoma, and that is wide excision *en bloc* including deep fascia, with closure by skin graft or some other plastic manoeuvre, exceptions being in the case of children or lesions of the face. Incomplete excision of an apparently simple fibroma in the popliteal region in another patient was followed by a quick recurrence, and subsequent excision resulted in the correct diagnosis of a liposarcoma.

In biopsy of suspect breast lesions, excision of the lump is safer than incisional biopsy, especially if a time lag for definite surgery is unavoidable. Surely a snip biopsy of a breast cancer is allowable only when frozen section examination is available, or if the surgeon is satisfied by the macroscopic appearances and has the facilities to proceed with whatever immediate surgery he thinks indicated. Some centres as a routine examine biopsy specimens of internal mammary, axillary and supraclavicular nodes before embarking on a surgical programme for treating carcinoma of the breast. Similarly in pulmonary lesions, scalene nodes, supraclavicular fat pads and mediastinal nodes may be excised for diagnostic purposes and for evaluation of operability before thoracotomy is attempted. A prophylactic "umbrella" of cancer chemotherapy is also prescribed in an attempt to destroy dislodged cancer cells before they can take root.

The risks seem negligible that cancer cells will be disseminated and growth stimulated by incisional biopsy from exposed surfaces of basal and squamous cell carcinoma of the skin, lip, mouth, tongue, rectum, cervix and bone, as are the risks from endoscopic snippings from the oesophagus, prostate, rectum and bronchus. Testicular puncture in sterility clinics is an often used procedure. Pancreatic biopsy can be an unhappy performance, and in the region of the head of the gland, can be more safely performed through the duodenum.

Injection of radioactive isotopes with subsequent scanning is of value in locating primary nodules in the thyroid, metastases from thyroid carcinoma and cerebral tumours. Radioactive phosphorus is used similarly in suspected breast lesions, but the correct interpretation of tissue histopathological findings is better obtained by biopsy, and at much less cost. Examination with the Wood's lamp is used in some instances as a fluorescent diagnostic procedure in the differentiation of squamous and basal cell carcinomata of skin.

However, the specific value of a biopsy in surgical practice is undoubted, and the diagnostic results are so satisfactory that the indications for its performance must be respected even in apparently minor lesions. Before primary treatment of any lesion by irradiation solely is begun, surely the diagnosis must be first established. This can easily be achieved by biopsy. Later, successive needle or punch examinations can be made, so that the follow-up is better controlled.

Acknowledgement.

Acknowledgement is due to Dr. H. Kramer for his helpful advice.

Sydney.

ERIC GOULSTON.

The Wider View.

CHILD HEALTH AND PSYCHIATRY IN CHINA TODAY.

With a party of Australian doctors, I went to China at the invitation of the Chinese Medical Association. We were in China from April 10 to May 9, 1957, and I made a brief investigation from the child psychiatric point of view.

The psychiatrists I met on the tour were undoubtedly capable and extremely busy with treatment and teaching, and psychiatry is given a place in the medical curriculum quite as high as in most Australian universities. Adult psychiatric hospitals are mostly crowded, but no more so than many of ours, and treatment is largely along orthodox Western lines. This was to be expected from the fact that the training of most of the senior men has been undertaken in Western schools in China, often with several more years in recognized schools overseas.

Some recognition of traditional Chinese medicine is enforced by decrees from higher levels. In all the mental hospitals visited there is room for the traditional doctor with his herbs, acupuncture and other methods of treatment, and an appreciable proportion of the patients are treated by them. It seems that their interest in the patient as a person in a social environment is at least as great as in the Western-trained doctors; but this impression was gained only at second-hand. The number of psychiatric beds in the country is by our standard very small, but is being increased rapidly in all the centres visited. It was stated that in 1955 the number was about 5000 for a population of 700,000,000, as compared with the four per 1000 generally regarded as essential in the Western world. Out-patient departments serve as additional aids in dealing with the problems, but are, it seems, very understaffed with rather poorly trained doctors. Convulsive therapy, unmodified by relaxants (almost entirely non-existent), drug therapy with recently available chlorpromazine as well as sedatives and glutamic acid, and psychotherapy designed to ease current stress appear to be available in these departments.

When one turns from adult to child psychiatry, there is an almost complete blank. There is apparently a ward in the Nanking neuro-psychiatric institute devoted to the study of children, but much effort to arrange a visit failed. This

¹ Read at a meeting of the Pediatric Society of Victoria on July 10, 1957.

seems to have been due to pressure of time and the need to coordinate the joint travels of the party, but it was nevertheless a great disappointment. No paediatric hospital that I saw had a psychiatric unit.

When psychiatrists were questioned as to their interest in child psychiatry, the answer was the same—an almost complete blank. Questions as to what was done with mental defectives, their education and training and their place in the community, what was done with the cerebral palsied and their problems in education and occupation, and what was done with the partially deaf and others presenting educational problems were met by surprise that one should be interested. Time again regrettably prevented an approach to educational authorities and psychological departments to see what their attitudes would be, but the lack of psychiatric interest seemed almost complete. When I turned to problems of behaviour and neuroses in children, the answer was that these were dealt with by the parents or regarded as unimportant. There seemed to be no realization of the possibility that adult psychiatric troubles could be prevented by psychiatric attention to the temper tantrums and moods, the sexual and toilet problems, the thumb-sucking and nail-biting, the trunancies and delinquencies and all the other problems that interest and plague the child psychiatrist and his team of psychologists, social workers, speech therapists, audiometrists and so forth.

This apparent blind spot naturally aroused my curiosity. I believe that one must surely assume that such problems exist, at least in some degree; but I wonder whether it is possible that the obstetrical practice is such that potential defectives die, or that the severity of conditions of life still existing, though apparently much less than formerly, has led to the early death of those handicapped by birth. Is it possible that the conditions of life, with manpower being used so much more for transport, and the lack of mechanization, enable the defective and dull to fit with less difficulty into the community, without the provision of all our special schools and grades? Does the childhood schizophrenia exist unnoticed and undiagnosed, as has been the case in most Western countries till recent years? Or does it not exist at all?

I wonder whether we are justified in placing such stress on the significance of behaviour problems of childhood. Are they really trivialities, to be outgrown with time and the common-sense approach of busy parents, and the intimate contact with all the facts of life inseparable from the crowded conditions of living in China? To this it seems should be added the supervision of the street committee, with the pressure it exerts on the wayward child and its parents, and the still dominant but disputed place of the grandparents in the family structure.

One very obvious factor seems to be that the psychiatrists are all so busy with the urgent problems presenting in the adults that they have little time for anything that can be dealt with by others or that seems of doubtful significance. Joined with this are their general lack of interest in depth psychology and the universal disinterest or scorn with which psycho-analysis seems to be regarded. Manifestations of infantile sexuality do not seem to be of the slightest interest or significance, and the complicated manoeuvres of the ego, super ego and id were thought of, if at all, as fantasies of the Western mind. Perhaps one explanation is a faith in possibilities of control and cure of adult disorders by community pressure and morale, and Chinese psychiatrists can point with pride to the practical elimination of narcotic addiction, alcoholism and prostitution in the few years "since liberation" in 1949. This pressure is undoubtedly very real, and seems to stem from the intimate knowledge of the behaviour of the individual which is possessed by the street committee, and from the high morale and puritanical zeal which seem to be characteristics of present-day China.

Conclusion.

The answer to the question why child psychiatry is practically non-existent and why its problems are unrecognized cannot be given with any degree of certainty; but as this and other questions still exist, it seems regrettable that contacts with a country of 700,000,000 inhabitants are possible to such a few. Western training has been of tremendous value to China in the past, but is now well-nigh impossible except in Russia. Some way to overcome this and allow students from China to visit Western teaching centres is a great need for China and for the West today.

JOHN WILLIAMS.

Melbourne.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

AN EPIDEMIC OF TYPHOID FEVER.¹

[From the *Australian Medical Gazette*, March, 1887.]

THE Victorian Central Board of Health proposed to establish a camp hospital for patients suffering from typhoid fever on a secluded site within the Royal Park. This project, however, had to be abandoned, the reason assigned being the scarcity of water in the locality, though in reality, the carts loaded with tents and the necessary building material, had been refused admission at the Royal Park by order of the Trustees. The alternative site in the Alfred Hospital grounds was then accepted, and on February 15 the temporary buildings were placed in position. They comprise four tents supplied by the Defence Department and two portable houses granted by the Railway Commissioners. The use of the Hospital Grounds for the accommodation of typhoid patients was granted to the Central Board of Health on the following conditions:

That the Central Board of Health shall provide:

1. Tents fully equipped with beds, bedding, furniture, baths, etc.
2. Shall erect and remove the same or any temporary erections at their own expense, and make good any damage done to the grounds.
3. Shall take care to have drainage properly laid down, on the same system as now in vogue.
4. Shall provide at their own expense a duly qualified medical officer to take charge of the new patients.
5. Shall pay to the Alfred Hospital all expenses incurred in maintaining the patients in their tents.
6. That medical officer and patients are to come under and be amenable to the rules of the Alfred Hospital.

The Alfred Hospital is to:

1. Place the patients under new honorary medical staff.
2. Supply food, medicine and nursing and to find board and residence for the extra medical officer.

Correspondence.

MEDICINE AND THE LAY PRESS.

SIR: I am not a member of the medical profession, nor of the lay Press, but, being obliged to read all medical journals in my daily occupation, I am disturbed by the attitude demonstrated by your correspondent, R. Paterson, on September 14, 1957.

In all humility, might I point out that from time to time senior and widely renowned members of your profession have been troubled by a growing decline in the doctor-patient relationship in recent years. It will be much happier for both when a greater understanding is reached, and I make bold to suggest that such attitudes as Dr. Paterson's will not contribute to this end.

The modern patient is much better read in medicine than his father, he has his "digests", his journals, his semi-medical books, and he has his local chemist, who is often far more agreeable to explain puzzling matters to him than his medical adviser. If his confidence has been shaken, it has not been altogether due to articles published in the lay Press, but his own and his friends' experiences at the hands of doctors like Dr. Paterson, who are no doubt too busy to seriously consider their attitudes to patients. Often the patient has felt modern medicine to be cold, hard and

¹ The camp, opened on February 18, was finally closed on May 26. There were in all 69 admissions—57 males, 12 females. Eight patients died. Twelve, remaining under treatment, were transferred to the general wards of the Alfred Hospital.

objective. He often gets kinder help outside the profession. He senses only too well that he is considered a fool, and the less he is told the better, and he resents it—particularly when he is modestly aware that his own occupation calls for a high degree of intelligence in circles where Dr. Paterson's would be the lay mind.

In our daily tasks many of us are called upon to be "pestered" by the neurotic and the borderline mental case, but in most instances it is simple reassurance they seek.

I also submit, from a survey conducted in your own journals, that many doctors are too busy to read medical journals. Could it be that the lay Press may draw attention to some urgent matter that should not await that spare time that rarely arrives?

Even if Dr. Paterson does not number among these so busy men, while he refuses to accept patients as people with surely every right to concern themselves with their own welfare when they fear, and too often with justification, that it is in jeopardy, and if their confidence is so swiftly shaken, then there is truly something wrong with the doctor-patient relationship—and the core of the matter goes far deeper than summaries of articles from your Journal published in the lay Press.

Yours, etc., Y. WEBB.

G.P.O. Box 4865,
Sydney,
September 23, 1957.

A MEMORIAL TO DR. ELSIE DALYELL.

SIR: As a memorial to the late Dr. Elsie Jean Dalyell, O.B.E., her friends are furnishing a room in the new wing being erected at the Women's College, the University of Sydney.

I shall be pleased to receive contributions towards a fund for this purpose.

Yours, etc., MARJORY LITTLE.

1 Riddle's Lane,
Pymble,
New South Wales.
October 5, 1957.

PSYCHOTHERAPY IN GENERAL PRACTICE.

SIR: I wish to comment on Dr. M. Jansen's recently published paper on "Psychotherapy in General Practice", and, with his permission, on his practice generally. I did a locum for him last year, and having had psychiatric experience, was very interested in his work.

Dr. Jansen mentions "temporary adverse reaction" from the community to his new approach. From what I heard this was at first quite vehement. It required courage to carry on in face of opposition from members on the hospital board. The reasons for the opposition appear to have arisen from misconceptions about psychotherapy, from the comparative isolation of the community, and from the somewhat abrupt change in Dr. Jansen's approach to neuroses. His perseverance was rewarded, and his methods are now generally accepted.

His work on hypnosis did not meet the same mistrust. This may appear strange in view of its somewhat unorthodox flavour. However, its results are much more direct and more readily observed. The majority of his obstetric cases are now asking for hypnosis. Those who have experienced it give glowing descriptions of their painless labours.

He speaks about the neurosis having to be "ripe" for treatment. This problem presents itself continually in general practice, where patients with all kinds of neurotic conflicts are seen continually about other illnesses, which may or may not be related to their conflicts. One has to decide when to attempt probing. Further, the therapist needs to follow patients' own pace. Instead of setting out a definite course of interviews, Dr. Jansen often allows the patient to space his treatments, which at times may be months apart.

The article refers to self-analysis and the need for the doctor to know himself if he is to do psychotherapy successfully. This points to a general lack of teaching facilities for such techniques. Perhaps the Post-Graduate Committee or the College of General Practitioners would consider setting up teaching and research groups similar to those at

Tavistock Clinic under M. Balint (discussed in his book "The Doctor, His Patient, and the Illness"). The "bewildering array of observations and results" referred to in Jansen's article could be studied by such groups in conjunction with the learning programme.

I think Dr. Jansen should be congratulated for his initiative and courage in pursuing this difficult subject, offering comparatively little financial gain, and often at considerable personal inconvenience.

Yours, etc.,

854 Victoria Road,
Ryde,
New South Wales.
September 29, 1957.

J. LISYAK.

AN UNUSUAL LOBOTOMY.

SIR: Reading in "Current Comment" of September 21 your report of an unusual lobotomy recalled to my mind a somewhat similar case some 30 years ago. A boy in his teens, of a most unruly type, had been scolded by his parents after his latest escapade. He then went into the passage and shot himself with his father's revolver—transversally through his frontal area. After giving first aid (and, incidentally, narrowly escaping a similar injury myself from his distraught father), the unconscious boy was removed to hospital and trephined. Near the point of exit was found an old depressed fracture of the inner table pressing on the cortex. This was freed and removed, and after haemostasis the wound closed. The boy not only made an uneventful recovery, but on returning home was a perfectly normal and biddable boy. On questioning his parents, I found that about six years prior to this, he had been riding his bicycle, and had been hit on the head by the shaft of a horse-drawn vehicle, with little noticeable injury at the time. Subsequent to this his unruly behaviour began. I think his case is the most satisfactory result of a modified leucotomy that I have known.

Yours, etc., A. WEIGALL.

"Walmer",
Grange Road,
Frankston,
Victoria.
October 1, 1957.

MATERNAL AND FETAL PROGNOSIS IN TOXAEMIA OF PREGNANCY.

SIR: The achievement of the combined staff of the Women's Hospital, Crown Street, in greatly reducing the incidence of eclampsia at the hospital is now well known and quoted in text-books and medical journals of many countries. What is less well known and less referred to is the origin of this planned attempt to prevent eclamptic convulsions.

The recent article by Professor F. J. Browne (August 10, 1957) and a letter by Dr. R. H. J. Hamlin (September 7, 1957), both in your Journal, prompt me to refer to the originator of this plan, which when carried out in its entirety had, and continues to have, results unexpected by many. In 1948 Dr. Dixon Hughes attended a British Congress of Obstetrics and Gynaecology in Dublin, and whilst there was fortunate enough to hear someone of authority express an opinion that with our present knowledge, eclampsia was not preventable. This was sufficient stimulus to make him set out to prove otherwise. On returning to Australia, with the cooperation of the hospital staff, he was able to establish methods for improving ante-natal care and to set standards for the admission of patients to hospital considerably more rigid than formerly. At this time the hospital was fortunate in having as medical superintendent Dr. Hamlin, who enthusiastically devoted himself to this work. He had indeed, earlier than this, sought permission from the honorary medical staff to give daily lectures to all new patients on the value of low carbohydrate, high protein diet.

Much emphasis has been laid on weight control, but this was only a part of Dixon Hughes's plan of prevention. The basis of the plan was non-acceptance of an arbitrary level of blood pressure as "normal", be it 120/80 or 140/90, and insistence on a patient's admission to hospital if her diastolic blood pressure was consistently increased by more than 10 millimetres of mercury over her basic blood pressure as

determined at her first visit to the ante-natal clinic. Such a rise is not always associated with excess weight gain, nor is weight gain necessarily followed by an increase in blood pressure. A patient is admitted to Crown Street Hospital not only to control excess weight gain, but also because of a rise in blood pressure above her basic level and not related to an accepted so-called "normal". Frequently both conditions are present.

It cannot be stressed too much that without adopting the Crown Street system as a whole, a hospital is unlikely to obtain similar results. These results are usually presented in the form of a striking graph. The exact figures are: (I) in seven years (1943-1949), 26,645 "booked" patients delivered with 53 cases of eclampsia, the incidence being 1 in 503; (II) in eight years (1949-1957), 32,826 "booked" patients delivered with eight cases of eclampsia, the incidence being 1 in 4103. A corresponding reduction in the incidence of severe preeclampsia has led to considerable foetal salvage.

It is relevant to note that Hamilton, Pickering *et alii* have recently shown that the common practice of dividing blood pressure levels into normal and abnormal, at any value, is clearly an artefact. This observation does not deny the fact that expectation of "toxæmic" manifestations in the pregnant woman is directly related to arterial pressure; it also lends significance to our contention that an upward rise of blood pressure from any previous level demands attention long before it reaches any arbitrary "danger" level.

Yours, etc.,

JOHN CHESTERMAN.

135 Macquarie Street,
Sydney,
October 1, 1957.

References.

- HAMILTON, M., PICKERING, G. W., ROBERTS, J. A. F. and SOWRY, G. S. C. (1954), "Etiology of Essential Hypertension: Arterial Pressure in General Population", *Clin. Sc.*, 13:11.
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Medical Societies.

THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.

A MEETING of the Medical Sciences Club of South Australia was held on September 6, 1957, at the Anatomy Department, University of Adelaide.

Cytoplasmic Activity of Antibody Formation.

DR. H. HOFFMAN read a paper on the cytoplasmic activity of antibody formation. He said that popliteal lymph nodes of mice, which had either washed sheep erythrocyte suspensions or cholera vaccine injected into the footpad, had been studied under the electron microscope. The earliest changes observed, occurring from 12 hours after a second (booster) injection of antigen, were in the nuclei of reticulum cells and large lymphocytes, in which a denuding process had commenced; the chromosomal filaments, consisting of 25 to 35 A.U. thick cores of DNA, surrounded by a variable amount of histone, lost that histone, presenting an appearance of fine filaments of apparently naked DNA. Some diffuse material appeared to move to the nuclear membrane, resulting in a dense accumulation on either side. Soon after that, the endoplasmic reticulum system of intracytoplasmic membranes dilated and hypertrophied tremendously, and secretory material accumulated in its spaces. That stage had been identified in previous literature as the plasma cell. While that secretory process advanced in the cytoplasm, granules indistinguishable by size, density and shape from cytoplasmic RNP particles appeared on the denuded chromosomal filaments. They accumulated, moved to the nuclear membrane and passed out to the cytoplasm through narrow tubular passages or large breaks in the membrane, eventually settling down on the reticular membranes. The reticular membrane system soon afterwards collapsed down, the secretion apparently having been exuded, presumably through openings of the reticulum to the cell surface. In the aftermath of active secretion the histone was gradually restituted on the chromosomal filaments, and RNP granules accumulated in the cytoplasm, both on the membrane surfaces and in clumps between them.

The Growth Cycle of Poliomyelitis Virus in Monkey Kidney Cells.

MR. D. W. HOWES discussed the growth cycle of poliomyelitis virus in monkey kidney cells. He said that one-step growth experiments on infected cells suspended by means of versene showed that with that system, and under the conditions of the experiments, there was a pronounced delay in release of virus. The majority of the virus produced by the cells remained associated with the cells for many hours after virus maturation had been completed, although small amounts were released during maturation. Three main phases were distinguishable—an "eclipse phase" lasting approximately four hours, a "maturation phase" characterized by the average maturation time (the time at which 50% of the virus had been produced), varying from five to more than eight hours, and a "post-maturation release phase", during which, with total virus constant, free virus increased very slowly. The "average liberation time" (the time at which 50% of the virus produced had been released) was not reached in experiments lasting 10 to 11 hours; but in two experiments the times were estimated to be approximately 16 and 25 hours respectively.

Post-Graduate Work.

THE MELBOURNE MEDICAL POST-GRADUATE COMMITTEE.

PROGRAMME FOR NOVEMBER, 1957.

Country Courses.

Horsham.—On Saturday, November 9, at the Wimmera Base Hospital, the following course will be given: 2.30 p.m., "Ante-Partum Hemorrhage", Professor Lance Townsend; 4 p.m., "Diagnosis of Endocrine Disease", Dr. H. P. Taft; 5 p.m., short talk on the work at the Walter and Eliza Hall Institute of Medical Research, Dr. Ian Mackay; 8.15 p.m., "Intestinal Obstruction", Mr. J. Grayton Brown. Dr. Ross Webster, 24 Wilmoth Avenue, Horsham, is the local secretary for this course.

Bendigo.—On Saturday, November 16, at Lister House, Northern District School of Nursing, 37 Rowan Street, Bendigo, the following course will be given: 2 p.m., "Diagnosis and Management of Some of the Dyspepsias", Dr. Leslie Hurley; 3 p.m., "Recent Development in Virus Research", Dr. A. A. Ferris; 4.30 p.m., "Uterine Cancer", Mr. A. Hill. Dr. A. J. Walters, 514 High Street, Golden Square, Bendigo, is the local secretary.

Hamilton.—On Saturday, November 16, at the Hamilton Base Hospital, the following course will be given: 2.45 p.m., "Deficiency Diseases in Childhood", Dr. John Colebatch; 5 p.m., "Surgery and Thyroid Glands", Mr. A. R. Kelly. Dr. R. R. Sobey, 6 Spence Street, Warrnambool, is the secretary of the Southwest Subdivision.

Mooroopna.—On Saturday, November 23, at the Mooroopna Base Hospital, the following course will be given: 2.30 p.m., "Common Vascular Disease", Mr. E. E. Dunlop; 4.30 p.m., "Early Symptoms of Common Psychoses", Dr. E. Cunningham Dax. Dr. B. R. Schloeffel, Maud Street, Shepparton, is the local secretary.

Ballarat.—On Thursday, November 28, at Craig's Hotel, Ballarat, at 8 p.m., Mr. Rowan Webb will lecture on "Chronic Leg Ulceration". Dr. N. Pescott, 626 Sturt Street, Ballarat, is the local secretary.

Fees.—The fee for each of the above-mentioned lectures is 15s., payable to the Melbourne Medical Post-Graduate Committee, but those who have paid an annual subscription to the Committee are invited to attend without further charge.

Flinders Naval Depot.

At Flinders Naval Depot on Wednesday, November 13, at 2.30 p.m., Dr. Allan M. Beech will speak on "Recent Advances in Vascular Surgery". This meeting is to be held by arrangement with the Royal Australian Navy.

Information.

The address of the Melbourne Medical Post-Graduate Committee is 394 Albert Street, East Melbourne. Telephone: FB 2547.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Post-Graduate Conference at Cooma and Bega.

The Post-Graduate Committee in Medicine in the University of Sydney, in conjunction with the Far South Coast and Tablelands Medical Association, will hold a post-graduate conference at Cooma and Bega on Friday, Saturday and Sunday, November 15, 16 and 17, 1957. The programme is as follows:

Friday, November 15, at the Cooma District Hospital: 7.45 a.m., registration; 8 a.m., practical demonstrations in anaesthesia, Dr. Brian Dwyer.

Saturday, November 16, at the Bega District Hospital: 7.45 a.m., practical demonstrations in anaesthesia, Dr. Brian Dwyer; 2 p.m., registration; 2.15 p.m., (a) "Recent Advances in Obstetrical Treatment" and (b) "Management of Third Stage of Labour", Dr. Stanley D. Meares; 3.30 p.m., "Recent Advances in Cardiac Therapeutics", Dr. George V. Hall.

Sunday, November 17, at the Bega District Hospital: 9.30 a.m., "The Management of Respiratory Failure", Dr. Brian Dwyer; 10.30 a.m., (a) "Vaginal Discharge" and (b) "Pruritus Vulvae", Dr. Stanley D. Meares; 11.45 a.m., "Nephritis and Renal Failure", Dr. George V. Hall; 2.30 p.m., "Local Anaesthesia", Dr. Bryan Dwyer.

The fee for attendance at the course is £3 3s. Those wishing to attend are requested to notify Dr. E. C. Blomfield, Honorary Secretary, Far South Coast and Tablelands Medical Association, 104 Gipps Street, Bega, as soon as possible. Telephone: Bega 82.

Annual Subscription Course.

The Post-Graduate Committee in Medicine in the University of Sydney announces that Sir Geoffrey Jefferson, C.B.E., M.S., F.R.C.S., Emeritus Professor of Neurosurgery, University of Manchester, Honorary Surgeon, Manchester Royal Eye Hospital, and Adviser, Head Surgery, to the Ministry of Health, England, will give the following lectures in the annual subscription course: Wednesday, October 30, at 2 p.m., in the Maitland Lecture Theatre, Sydney Hospital, "Lesions of the Cavernous Sinus"; Friday, November 1, at 8 p.m., Broughton Hall Psychiatric Clinic, Leichhardt, "The Applied Physiology of Sleep and Stupor"; Tuesday, November 5, at 8 p.m., The Royal Newcastle Hospital, "The Search for the Anatomical Seat of the Soul".

On Wednesday, November 6, at 8 p.m., at the Northcott Neurological Centre, Cammeray, there will be a presentation of interesting neurological cases.

World Medical Association.

SECOND WORLD CONFERENCE ON MEDICAL EDUCATION.

Doctors and medical educators of the world will be convened to consider the theme "Medicine: A Life-Long Study" at the second World Conference on Medical Education, to be held at Chicago, Illinois, from August 30 to September 4, 1959. This conference will be sponsored by the World Medical Association. Collaborating organizations include the World Health Organization, the International Association of Universities and the Council on International Organizations of Medical Sciences.

The programme committee, under the chairmanship of Dr. Victor Johnson, Director of the Mayo Foundation for Medical Education and Research, University of Minnesota Graduate School, invites members of medical schools and faculties, member national medical associations and their medical education committees, and organizations and individuals interested and qualified in medical education, to submit to it topics and problems that should be considered within the frame of reference of a conference devoted to exploring the continuing education of the doctor after graduation from medical school.

Four general section subjects are currently being considered. These are: (i) basic clinical training for all doctors; (ii) advanced clinical training for general and specialty practice; (iii) education for research and teaching; (iv) methods of continuing medical education throughout life.

Dr. Raymond B. Allen, Chancellor of the University of California in Los Angeles, has been named President of the second World Conference on Medical Education. Dr. Ray F. Farquharson, Sir John and Lady Eaton Professor of Medicine, University of Toronto, Canada, and Dr. Victor Johnson, University of Minnesota Graduate School of Medicine, U.S.A., will act as Deputy Presidents.

The objective of the conference is an exchange of information for the purpose of assisting in raising the standards of medical education of the world. This follows the pattern set by the first World Conference on Medical Education held in London, England, in 1953, which devoted its deliberations to undergraduate medical education.

Simultaneous translation of English, French, Spanish and, if feasible, German, will make possible the stimulating exchange of ideas and information—the inevitable result when doctors, who in their homelands speak many languages, convene, and the thought and language of medicine are universal.

The programme committee wishes to provide the conference with competent representative speakers and participants for panel and group discussion from every area of the world, to stimulate thought-provoking topics and consider problems universal to the doctor who has completed his basic medical education, regardless of his age, mode of medical practice or specialized interests or education. To accomplish this, the committee needs suggestions and guidance in the selection of conference topics and eminent doctors qualified to speak on these subjects. Each country of the world recognizes doctors of this calibre within its nation. Every medical organization of the world is cordially invited to submit the names of these experts, the area of each expert's proficiency, and topics and subjects, the discussion of which at such a world forum would prove useful in elevating the standards of medical education the world over. Suggestions should be addressed to the World Medical Association, 10 Columbus Circle, New York 19, N.Y., U.S.A.

Naval, Military and Air Force.

APPOINTMENTS.

The following appointments, changes etc. are promulgated in the *Commonwealth of Australia Gazette*, No. 52, of September 26, 1957.

NAVAL FORCES OF THE COMMONWEALTH.

Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

Confirmation in Rank.—Surgeon Lieutenant (for Short Service) (on probation) William Russell Richards is confirmed in the rank of Surgeon Lieutenant (for Short Service), with seniority in rank of 5th July, 1956.

AUSTRALIAN MILITARY FORCES.

Citizen Military Forces.

Northern Command.

Royal Australian Army Medical Corps (Medical).—1/39057 Captain H. H. Chesterfield-Evans ceases to be seconded whilst in the United Kingdom, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command), 19th March, 1957. The provisional appointments of the following officers are terminated: Captains 1/39184 G. B. Cavaye, 25th November, 1956, 1/46946 R. N. Gale, 21st May, 1957, 1/61852 J. F. O'Duffy, 21st May, 1957, and 1/61769 L. J. Lowth, 12th July, 1957. To be Captains (provisionally): 1/39184 Graham Bell Cavaye, 26th November, 1956, 1/46946 Rowland Norman Gale, 22nd May, 1957, 1/61852 John Francis O'Duffy, 22nd May, 1957, and 1/61769 Lawrence John Lowth, 13th July, 1957.

Eastern Command.

Royal Australian Army Medical Corps (Medical).—2/100752 Major R. D. Rothfield is seconded whilst in the United Kingdom, 14th April, 1956. 2/52118 Lieutenant-Colonel E. H. Hipsley is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command), 26th July, 1957. To be Captains (provisionally): 2/79254 Raymond Julian Malcolm Atkinson, 15th July, 1957, and 2/146614 Kenneth Francis Hume, 25th July, 1957.

Central Command.

Royal Australian Army Medical Corps (Medical).—4/31987 Captain R. T. W. Reid ceases to be seconded whilst in the United Kingdom, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Central Command), 26th July, 1957. The following officers are transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Central Command): 4/32002 Captain A. R. Anderson, 25th July, 1957, and 4/32072 Captain (Honorary Major) M. G. Gratton, 6th August, 1956.

Western Command.

Royal Australian Army Medical Corps (Medical).—5/45851 Captain (provisionally) G. H. Hingston relinquishes the

provisional rank of Captain, 31st July, 1957, is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Western Command), and is granted the honorary rank of Captain, 1st August, 1957. The provisional appointment of 5/26527 Captain D. G. Kermod is terminated, 17th June, 1957. To be Captain (provisionally), 18th June, 1957: 5/26527 Denis Graham Kermod.

Tasmania Command.

Royal Australian Army Medical Corps (Medical).—The provisional appointment of 5/15206 Captain D. J. Walters is terminated, 8th March, 1957. To be Captain (provisionally), 9th March, 1957: 5/15206 David John Walters.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps (Medical).

Northern Command.—To be Honorary Captains: David Graham Simpson, 9th August, 1957, and Ronald Andrew Packer, 12th August, 1957.

Southern Command.—To be Honorary Captains: William Maxwell Kimber, 11th March, 1957, and John Reddish, 6th May, 1957.

The following officers are placed upon the Retired List (Eastern Command) with permission to retain their rank and wear the prescribed uniform, 15th August, 1957: Colonel (Honorary Brigadier) J. Steigrad, C.B.E., E.D., Colonel J. C. Belisario, C.B.E., E.D., Lieutenant-Colonels N. W. Francis, S. C. M. Hiatt, A. A. Moon, M.B.E., and H. M. Saxby, E.D., Majors W. A. Conolly, J. H. D. Edwards, F. J. McEncroe and R. V. Rickard, Captains T. W. Miles, S. F. Tee and R. C. Worrell, and Lieutenants L. S. Ormerod and C. J. F. Sceats.

The College of General Practitioners.

NEW SOUTH WALES FACULTY.

Pfizer Post-Graduate Week-End.

THE Pfizer Post-Graduate Week-End, organized by the New South Wales Faculty of the College of General Practitioners, is to be held at Orange on November 8 to 10, 1957. The programme is as follows:

Saturday, November 9: 2.30 p.m., "The Diagnosis of Pigmented Skin Tumours", Professor Maurice Ewing, Professor of Surgery in the University of Melbourne; 4 p.m., "Disorders of the Nervous System in General Practice", Dr. K. B. Noad.

Sunday, November 10: 9.30 a.m., "Headache", Sir Geoffrey Jefferson, Emeritus Professor of Surgery in the University of Manchester; 11 a.m., "The Continuing Education of the General Practitioner", Dr. V. M. Coppleson, Chairman of the Post-Graduate Committee in Medicine in the University of Sydney; 11.30 a.m., "Brains Trust", by the guest lecturers.

Sir Geoffrey Jefferson is attending as a guest lecturer through the courtesy of the Post-Graduate Committee in Medicine.

Congresses.

FIFTH INTERNATIONAL CONGRESS ON DISEASES OF THE CHEST.

THE American College of Chest Physicians announces that the fifth International Congress on Diseases of the Chest will be held at Tokyo, Japan, from September 7 to 11, 1958, under the patronage of the Government of Japan and the Japan Science Council. The Congress has been endorsed by the Japan Medical Association. Scientific papers, panel discussions, fireside conferences and motion pictures will be presented on the following subjects: coronary disease, occupational diseases of the chest, benign and malignant chest tumours, tuberculosis, cardio-pulmonary function studies, asthma and emphysema, cardio-vascular surgery, broncho-oesophagology, tropical diseases of the chest, etiology of lung cancer, paediatric cardiology, metabolic disorders, miscellaneous topics on chest diseases. Eminent scientists from countries throughout the world will participate in the discussions, which will be simultaneously interpreted into the three official languages for the Congress—Japanese, French and English. There will also be scientific and commercial exhibits and visits to various medical institutions and hospitals in Japan.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED OCTOBER 5, 1957.¹

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	1(1)	5(8)	4(2)	..	..	..	..	..	10
Amoebiasis .. ..	..	..	..	..	..	..	..	..	..
Ancylostomiasis	1	..	1	..	..	..	..	..	2
Anthrax .. ..	..	..	..	..	..	..	..	..	..
Brucellosis .. ..	..	1	..	..	..	..	..	..	1
Cholera .. ..	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus) .. ..	..	..	..	..	..	..	..	..	..
Dengue .. ..	..	..	..	..	..	..	..	..	..
Diarrhoea (Infantile)	2(1)	5(5)	1	..	..	..	..	..	8
Diphtheria .. ..	..	..	..	..	2(2)	..	..	..	2
Dysentery (Bacillary) .. ..	..	2(2)	1	2(1)	1(1)	..	1	..	7
Encephalitis .. ..	..	1	..	..	..	..	..	..	1
Filaria .. ..	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice .. ..	..	..	..	..	..	..	..	..	..
Hydatid .. ..	..	..	..	..	..	..	..	..	..
Infective Hepatitis	57(32)	28(8)	4(2)	5(3)	8(8)	1	..	1	104
Lead Poisoning .. ..	..	..	..	..	..	..	..	..	..
Leprosy .. ..	..	..	..	..	..	..	..	..	..
Leptospirosis	2	..	8	..	..	..	..	..	10
Malaria .. ..	..	..	1	..	..	..	..	..	1
Meningococcal Infection	1(1)	1(1)	3	..	1(1)	..	..	..	6
Ophthalmia .. ..	..	..	..	..	..	..	..	..	..
Ornithosis .. ..	..	..	..	..	..	..	..	..	..
Paratyphoid .. ..	..	..	..	..	..	..	..	..	..
Plague .. ..	..	..	..	..	..	..	..	..	..
Pollomyelitis	3	..	..	..	1(1)	..	..	..	4
Puerperal Fever .. ..	..	..	1	..	..	..	..	..	1
Rubella .. ..	..	36(23)	18(18)	20(10)	7(7)	..	..	1	82
Salmonella Infection .. ..	..	..	..	1(1)	2(2)	..	..	..	3
Scarlet Fever	8(5)	7(7)	3(2)	2(2)	2	..	..	..	22
Smallpox .. ..	..	..	..	..	..	..	..	..	..
Tetanus .. ..	..	1	1	..	1(1)	..	..	..	3
Trachoma .. ..	..	..	..	..	3(2)	..	..	..	3
Trichinosis .. ..	..	..	..	..	..	..	..	..	..
Tuberculosis	19(12)	6(5)	17(10)	2(2)	3(2)	5(2)	2	..	54
Typhoid Fever .. ..	..	..	..	..	1(1)	..	..	..	1
Typhus (Flea, Mite- and tick-borne)	1	..	2	..	..	..	..	..	3
Typhus (Louse-borne) .. ..	..	..	..	..	..	..	..	..	..
Yellow Fever .. ..	..	..	..	..	..	..	..	..	..

¹ Figures in parentheses are those for the metropolitan area.

The registration fee for each physician attending the Congress is \$25.00 (U.S. currency), and \$10.00 for each family member accompanying the physician.

The American College of Chest Physicians has a membership of over 6000 physicians representing 86 countries and territories throughout the world. Further information may be obtained from the following: Dr. Jo Ono, Secretary-General, Fifth International Congress on Diseases of the Chest, School of Medicine, Kelo University, 35, Shinanomachi, Shinjuku, Tokyo, Japan; Mr. Murray Kornfeld, Executive Director, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois, U.S.A.

INTERNATIONAL FEDERATION OF GYNÆCOLOGY AND OBSTETRICS.

The International Federation of Gynecology and Obstetrics was founded in Geneva in 1954, where it held its first World Congress. Meeting every four years, according to its constitution, the International Federation chose Montreal, Canada, as the site of its second World Congress, from June 22 to 28, 1958. All scientific sessions, scientific exhibits and moving pictures will be held in the newly built Queen Elizabeth Hotel. The main features will be plenary conferences with invited guest speakers, round-table discussions, and free communications. Information and registration forms may be obtained by writing to the Montreal Committee, Second World Congress, International Federation of Gynecology and Obstetrics, 1414 Drummond Street, Suite 220, Montreal 25, Quebec, Canada.

Notice.

BRITISH MEDICAL ASSOCIATION (VICTORIAN BRANCH).

In honour of the Victorian medical officers who lost their lives in the service of the Empire in the wars of 1914-1918 and 1939-1945, a short ceremony will be held at 11 a.m. in the foyer of the Medical Society Hall, 426 Albert Street, East Melbourne, on Monday, November 11, 1957. Those attending are requested to assemble at 10.45 a.m.

University Intelligence.

UNIVERSITY OF MELBOURNE.

Elections: Council and Standing Committee of Convocation.

The following eleven nominations have been received for five vacancies for representatives of graduates on the Council of the University of Melbourne: the Honourable Mr. Justice A. D. G. Adam, Dr. J. Eric Clarke, the Honourable Mr. Justice A. Dean, Dr. W. E. A. Hughes-Jones, Miss Molly Kingston, Emeritus Professor Sir Peter MacCallum, Mr. A. McDonnell, Mr. F. J. Mulrooney, His Honour Judge J. G. Norris, Mr. E. W. O. Perry, Dr. W. G. D. Upjohn.

The only section of the Standing Committee of Convocation in which there will be an election is for graduates in science, there being four nominations for three vacancies—viz., Mr. W. G. Crewther, Mr. F. H. Flegner, Mr. L. J. Millar and Mr. R. E. Paul.

Voting papers will be sent to all graduates whose addresses are known. Graduates who wish to vote and do not receive voting papers by November 2 must apply to the Returning Officer by November 3. Voting papers must be returned before noon on Wednesday, November 27.

Nominations and Elections.

The undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Fowler, Francis Bursell, M.B., B.S., 1956 (Univ. Sydney), 27 Somerset Street, Epping, New South Wales.

The undermentioned has applied for election as a member of the Victorian Branch of the British Medical Association:

Burke, Denis Timothy, M.B., B.S., 1956 (Univ. Sydney), R.A.A.F., Point Cook, Victoria.

Deaths.

The following deaths have been announced:

MILES.—Thomas William Miles, on October 6, 1957, at Woodford, New South Wales.

McLAREN.—Charles Inglis McLaren, on October 9, 1957, at Kew, Victoria.

Diary for the Month.

- Oct. 31.—New South Wales Branch, B.M.A.: Branch Meeting.
- Nov. 1.—Queensland Branch, B.M.A.: General Meeting.
- Nov. 5.—New South Wales Branch, B.M.A.: Organization and Science Committee.
- Nov. 6.—Western Australian Branch, B.M.A.: Branch Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales. Anti-Tuberculosis Association of New South Wales.

Queensland Branch (Honorary Secretary, 88 L'Estrange Terrace, Kelvin Grove, Brisbane, W.1): All applicants for Queensland State Government Insurance Office positions are advised to communicate with the Honorary Secretary of the Branch before accepting posts.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

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